

# METAL PRODUCTS MANUFACTURING

# M P M

**Serving the Appliance and  
Fabricated Metal Products Industry**

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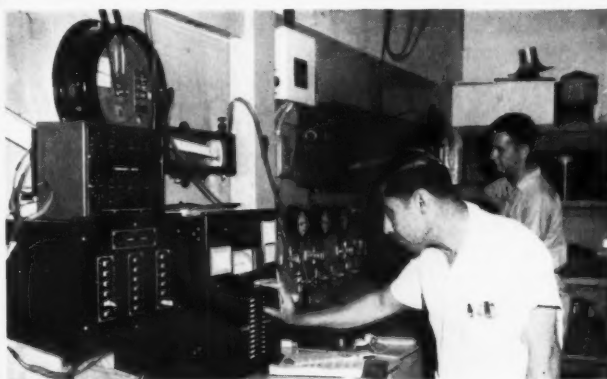
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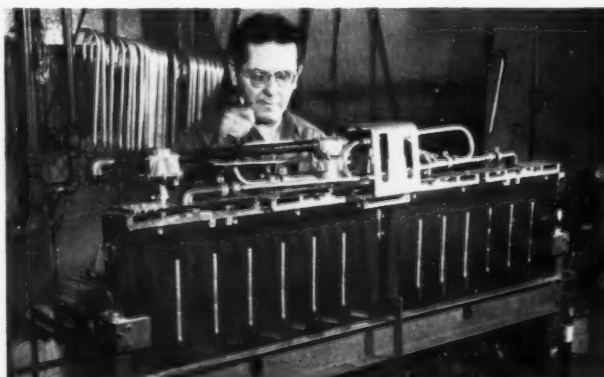
**DECEMBER 1960**



Pumping Heat The Texas Way — Page 31



Staff Coverage of Important Industry Meetings



How a Stamping Plant Went OEM — Page 40

FROM CONTROLS COMPANY OF AMERICA...



## First practical system that "feels" dampness

Direct-sensing moisture control  
ideal for clothes dryer applications,  
saves power and fuel

Moisture sensing makes good sense in clothes dryers. Particularly in commercial models, power savings, improved equipment performance, and greater production can be dramatic.

Now Controls Company of America makes this possible with a remarkably dependable direct-sensing unit. This control continuously measures moisture content with instantaneous control re-

sponse to cut off power at your predetermined moisture level. The units are thoroughly field-tested and now in production.

This important step forward in clothes dryer instrumentation also indicates possibilities for solid-state moisture sensing in the processing and drying of many organic and inorganic compounds and mixes.

Controls Company pioneering in this area has been hailed as "a new magnitude of reliability" by Texas Instruments, Inc., in its advertising (shown at right).



**C** CONTROLS COMPANY OF AMERICA develops first solid-state moisture-sensing system.

New magnitude of reliability introduced to moisture control field.

There is a new system that precisely measures moisture content with instant response to changes in moisture content. This system is a solid-state unit which offers superior and reliable response to the control of moisture content.

The system continuously measures moisture content with an instantaneous control response.

Available for immediate use in your plant. For more information, contact Controls Company of America, 9559 Soreng Avenue, Schiller Park, Ill. 60196.

TEXAS INSTRUMENTS CORPORATION

DAVIDSON - HARRIS - HARRIS - HARRIS



*Creative Controls for industry*

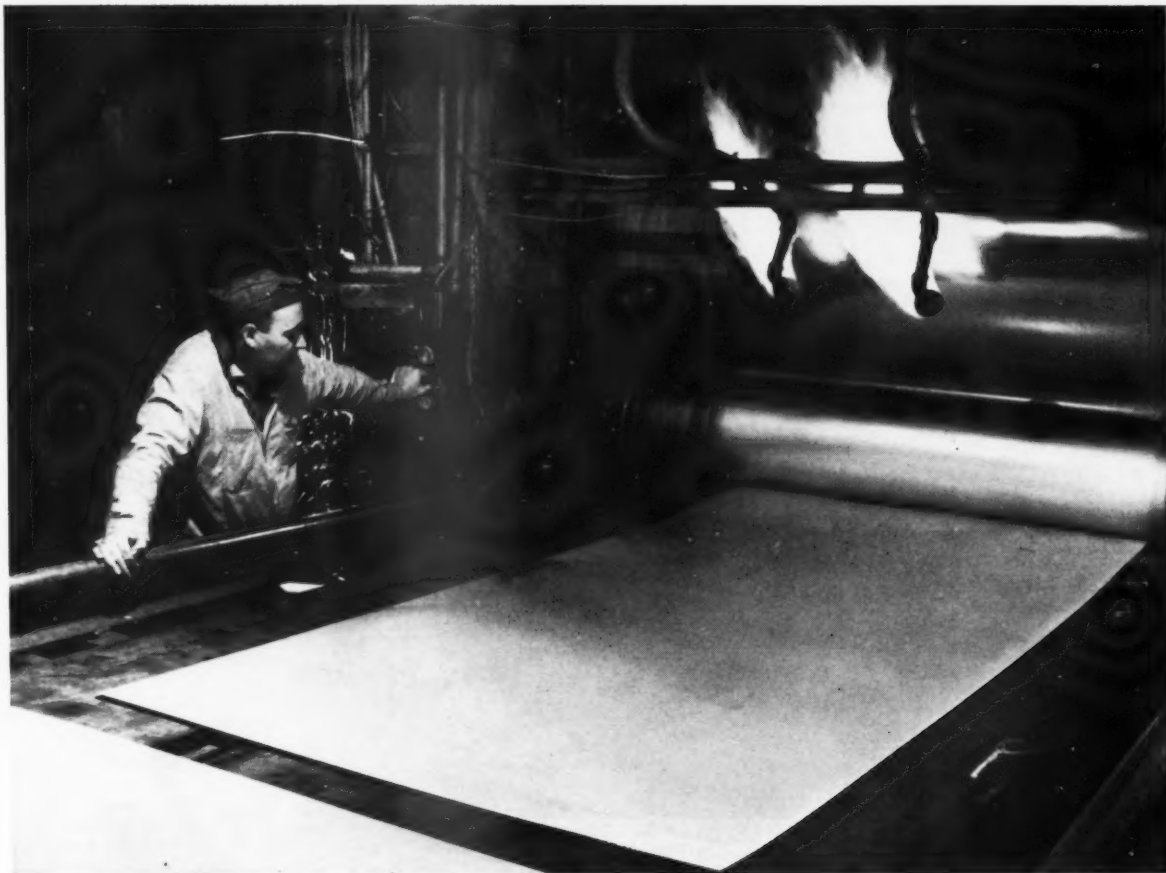
**CONTROLS COMPANY OF AMERICA**

APPLIANCE AND AUTOMOTIVE DIVISION

9559 Soreng Avenue, Schiller Park, Ill. • Cookville, Ontario • Zug, Switzerland

# Here's a special Armco metal that's made for porcelain enameling

New steels are  
born at  
Armco



That's why Armco Enameling Iron is "standard"  
for high quality finishes



- 1. Resists sag**—Armco Enameling Iron stubbornly holds its shape at *all* porcelain enamel firing temperatures. Critical dimensions stay accurate.
- 2. Commercially pure**—This special enameling base contains a strict minimum of carbon and gas-forming inclusions. Finish defects stay low.
- 3. Surface grips enamel**—The slightly-roughened surface of Armco Enameling Iron promotes even flow of slip and a tight porcelain-metal bond develops during firing.

#### Few rejects—more sales

Perfect fit and flawless finish are easier to achieve when parts are made from Armco Enameling Iron. This holds down costly rejects. It also means more sales appeal for clothes washers, dishwashers, ranges, refrigerators, and other products that receive critical customer inspection.

For complete information on Armco Enameling Iron, just write Armco Steel Corporation, 1140 Curtis Street, Middletown, Ohio.

## ARMCO STEEL



Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation



**Add your  
company name  
to this list of  
great names  
in the metal-working  
world who use  
Kerns products**

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American Motors Corp.  
American Steel & Wire  
Borg Warner Corp.  
Bridgeport Brass Co.  
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Buick  
J. I. Case Co.  
Caterpillar Tractor  
Chase Brass & Copper  
Chevrolet  
Chrysler Corp.  
John Deere Co.  
Douglas Aircraft  
Dow Chemical  
Ford  
General Electric  
Harnischfeger  
Harvey Aluminum Inc.  
Hotpoint  
IHC  
Kaiser Industries  
Keystone Steel & Wire  
Lockheed Aircraft  
Maytag  
Minneapolis Honeywell  
North American Aviation  
Northwestern Steel & Wire  
Olin Mathieson Chemical  
Pittsburgh Plate Glass  
Pontiac  
Remington Rand  
Republic Steel  
Revere Copper & Brass  
Reynolds Metals  
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Consult Kerns United now! Get the advantages of a product formulated to blend with *your own* operations.

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# MPM

(including finish)

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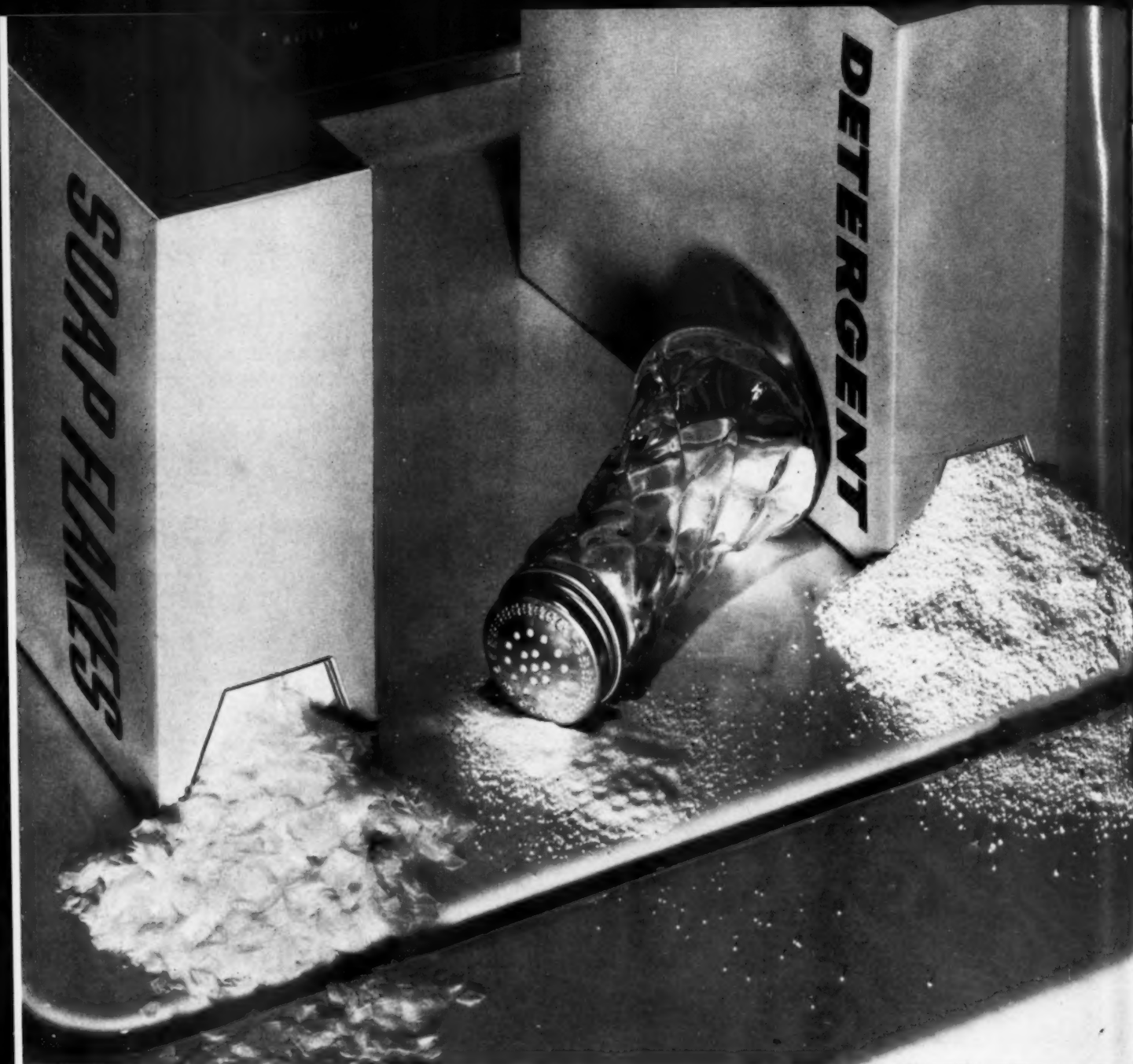
FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, sales management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is \$8.00 per year, domestic. To all other countries \$10.00 per year (U.S. funds). Single copies, \$1.00.

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Proved in laboratories and thousands of laundry rooms . . . Glidden NU-PON primer and NUBELITE enamel provide greatest resistance to the spills and splashes of laundry products.

Whatever your finishing requirements, Glidden will formulate a finishing schedule to give you exactly the protection you specify to meet any service conditions—corrosion, staining, impact, abrasion, heat and cold.

Your Glidden salesman can give you full information on the best Glidden metal finishing system for your particular product.



### FINISHES FOR EVERY PRODUCT

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No matter what your products, process, or problem, Glidden finishes plus Glidden Technical Service can provide the answer.



**ROSS**

Air Systems

...Engineered Atmospheres  
for Better Processing

## **Beer and Beverage Can OVEN—1960 Model**

Installed in late 1959, this conveyORIZED Ross Oven is in full production baking the inner linings of beer and beverage cans at the rate of 1000 cans per minute.

One of several basic types, this particular automatic unit was designed to fit the special production needs of Continental Can Company at one of its modern plants. Over the years, Ross Engineers have designed and installed over 100 beer and beverage can baking ovens in the major can manufacturing plants throughout the United States. Many of the earlier units are still in full and, in many cases, excess production, implying both sound design engineering and sturdiness of construction.



**J.O. ROSS ENGINEERING**

A Division of Midland-Ross Corporation / 730 Third Ave., New York 17, New York  
ATLANTA • BOSTON • DETROIT • LOS ANGELES • SEATTLE • MT. PROSPECT, ILL.





GREETINGS

*from the folks  
at Ferro*



# MPM

## clippings

The excessive preoccupation of business with artificial obsolescence and the techniques of volume selling has brought us to the point where some economic thinkers are already suggesting that master planners should tell us what to produce and sell, so that more resources can be devoted to non-commercial needs.

— George Romney, president, American Motors Corp.

Investment of \$6 million in a complete retooling program over the past four years has resulted in a 1961 appliance line that is the finest Admiral has ever shown. Introduction of exclusive design and engineering features is expected to give the movement of these products an encouraging lift which . . . should be significant next year.

— Ross D. Siragusa, president, Admiral Corp.

Artificial obsolescence is a deterrent to customer satisfaction, the most basic factor in business. . . We believe that prospective customers are strongly motivated to buy a new appliance when it becomes evident that it will do things not possible with earlier models. True obsolescence means that there is a real and demonstrable difference between the new models and those which were on the market previously.

— George M. Umbreit, president, The Maytag Co.

Salesmen must now carry the responsibility of learning to use what they sell and telling this story to women. Let's turn over a new page in selling methods. Let's tell the new homemaker what she wants to hear — how to use, how to care for — and then when they are in trouble let them know that we care, too.

— Mrs. Jesse Cartwright, home service director, Norge Div., Borg-Warner Corp.

We are deeply concerned with the fact that potential appliance customers have spurned our industry's products and spent their money elsewhere. Our industry has created this problem and must solve it. We feel a closer partnership between the dealer and the factory that seeks mutually satisfactory solutions is imperative.

— J. J. Anderson, marketing manager, Major Appliance Div., Westinghouse Electric Corp.

Business generally and the appliance industry specifically was "trapped in the numbers game" this year . . . the mythical philosophy that explosive population growth and new families would generate expanding markets.

— Judson Sayre, chairman of the board, Norge Div., Borg-Warner Corp.

I believe the action on the part of manufacturers to copy others instead of designing their own improvements has frequently forced the appliance engineering departments of most companies to add quasi-beneficial features in an attempt to improve their competitive position. It is reasonable to assume that an increased number of consumers sense and resent this. With a reduced sense of security and respect for any individual manufacturer, and perhaps the community of American manufacturers, the consumer may often purchase only such products as he must, and on a lowest-priced basis.

— Bertram Given, president, Waste King Corp.



No matter what shape they're in...

# CIPCO

(A DIVISION OF ESSEX WIRE CORPORATION)

produces high quality extruded plastic components for appliances, in quantity . . . competitively priced.

### • Control of Chemical Compounding

CIPCO formulates their own compounds (the first plant in the industry to do so) thus increasing the finished products capacity to resist aging.

### • Volume Production

Banks of extruders and years of production know-how guarantee on-time delivery of a quality component.

### • Engineering Experience

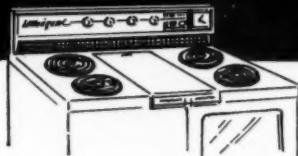
Vast experience in the development of seal, vibration dampening gaskets and other plastic applications is available to help formulate an extrusion tailored to your application.

Write, wire or call for complete information and samples.



**CAROLINA INDUSTRIAL PLASTICS**  
DIVISION ESSEX WIRE CORPORATION  
Mt. Airy, North Carolina

# What's Cookin'?



THE

# Still-Man TOPP BURNER

TRADE MARK

**WATCH FOR IT!**



**MANUFACTURING CORPORATION**  
429 EAST 164TH STREET • NEW YORK 56, NEW YORK  
The Last Word in Electric Heating Elements

**STILL-MAN MANUFACTURING CORP.**

429 East 164th Street, New York 56, N. Y.

Please keep us posted on what's cookin' with your new Still-Man TOPP BURNER Electric Surface Unit.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

15M-12-60

## MPM

### editor's mail

#### A new company

Gentlemen: We recently formed a new company here in Los Angeles for the purpose of engineering and manufacturing material handling equipment and machinery.

In order to keep our organization up-to-date with the latest allied and component products and processes, we would appreciate your forwarding subscription information for us to receive your METAL PRODUCTS MANUFACTURING magazine.

J. B. Schaeppi  
Purchasing Agent  
Marland Mfg. Co.  
Los Angeles, Calif.

#### The aluminum base alloys

Gentlemen: We would like to have one or two reprints or tear sheets of the feature "Fabricating the Aluminum Base Alloy," parts I, II and III. If there is any charge involved, please invoice us.

Thank you very much for your prompt attention.

L. W. Naberhaus  
Sales Promotion Dept.  
The Lodge & Shipley Co.  
Cincinnati, Ohio

#### The sheet metal industry

Gentlemen: Your magazine continues to be, in my personal opinion, one of the outstanding publications directed towards the sheet metal industry. Your feature article on our operations in your November issue was particularly well done, and I continue to use the reprints in my sales presentations to excellent advantage. Keep up the good work.

Joseph L. Cobane, Sales Manager  
Enamelstrip Corp.  
Div. of National Steel Corp.  
Detroit, Mich.

#### New product case histories

Gentlemen: I read your magazine regularly and find it very helpful — particularly the new product case histories. Thanks for keeping me on the mailing list.

Donald B. Lowe  
Industrial Designer  
Villa Park, Ill.

#### Rapidly changing world

Gentlemen: MPM helps one keep up-to-date in a rapidly changing business world.

Lyman S. Schultz  
Bally Metal Products, Inc.  
Palm, Pa.

to Page 47 →

DECEMBER • 1960 MPM



WRAP AROUND  
CABINET  
ENCLOSED ON  
EACH SIDE BY  
ALUMINUM  
EXTRUSIONS



PERFORATED  
STAMPED GRILLES

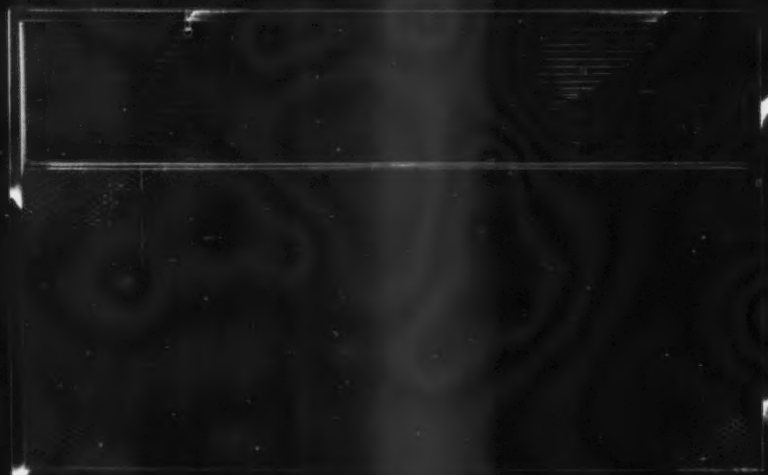
**A**luminum



*offers new design versatility in*

**AIR CONDITIONERS**

*through New Forms, Finishes  
and Fabricating Techniques* →



WRAP AROUND CABINET OF  
COLORWELD COIL. EXTERIOR  
GRILLE OF EXPANDED ALUMINUM.



HINGED GRILLE  
OF ALUMINUM  
SLATS

EXPANDED  
METAL GRILLE

# How **A**luminum offers air conditioner manufacturers **FLEXIBILITY** and **ECONOMY** IN STYLING, FABRICATING AND FINISHING

The sketches on the front side by Reynolds Styling and Design Department suggest a few of the many new ways that strong, lightweight, rustfree aluminum can contribute to air conditioner design. Because aluminum is the most versatile of all metals, it permits a wide range of styling freedom and fabricating and finishing techniques. Here are a few examples:

**In fabrication**, aluminum can be drawn, extruded, cast, stamped, roll formed, expanded, perforated or pierced. (The "idea" sketches show examples of expanded, extruded, stamped and perforated applications in air conditioner cabinets and grilles.) A wide choice of *attachment* methods is also available: welding, mechanical fasteners, tabs and cast pegs, bolts and rivets, metal stitching and epoxy resin adhesives are among the most common. In finishing, a wide variety of sales appealing *colors* can be easily obtained through painting or color anodizing. A variety of surface *textures* is also available.

This versatility also points the way to *manufacturing economies*. For instance, modern techniques in design, tooling and assembly permit higher rates of production with aluminum at low cost. Aluminum extrusions, with their nominal die costs, are a good example. Aluminum's light weight cuts costs of certain reinforcing or supporting parts. Lightweight aluminum also lowers handling and shipping costs. And lightweight, easier-to-handle aluminum air conditioner cabinets add important *consumer sales advantages*—especially in portable units.

**Economies in finishing** are also worth investigation. One-Side-Bright Aluminum can be used to eliminate costly buffing operations. Pre-painted aluminum sheet (Reynolds Colorweld Aluminum Coil) is ideal for applications calling for a painted stock. (Note air conditioner cabinet application in "idea" sketches.) Colorweld Aluminum Coil will

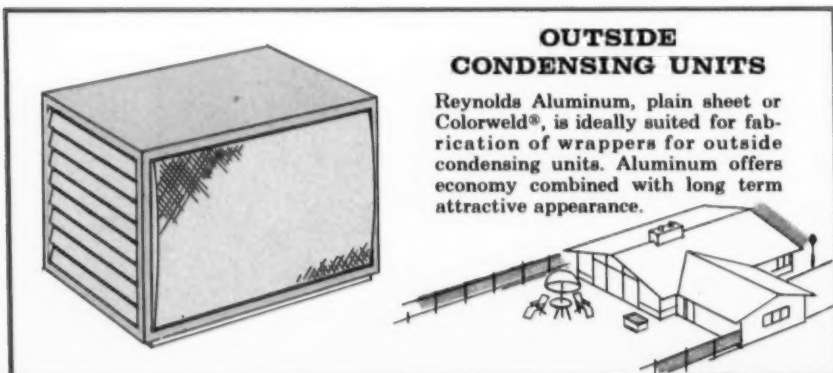
take most forming and fabricating operations without damage to paint surface.

Embossed or brush finished aluminum sheet, in standard or special designs, requires no additional finishing operations—permits low cost styling "change-overs". Laminates of aluminum with vinyl plastics or wood cut costs and weight in sandwich panel and other decorative or functional part construction.

**Permanence of aluminum** is important to you and your customers. Aluminum cannot rust, ever. This means that neither in-the-wall condensation nor year after year exterior exposure to the elements can cause aluminum cabinets to deteriorate. Unsightly rust stains on walls are eliminated.

New ideas for using aluminum in air conditioners and other appliances are being developed constantly. Reynolds Styling and Design and Product Development groups are ready to assist your own stylists and engineers in putting the newest and best aluminum forms, finishes and fabricating techniques to work in your products. Reynolds fabricating facilities are also at your service to assist in actual fabrication of finished aluminum parts. For highest quality aluminum mill products or for details on these services, contact your nearest Reynolds branch office or write *Reynolds Metals Company, Box 2346-AV, Richmond 18, Virginia*.

**NOTE:** Before you make or buy any appliance part, have it designed and priced in aluminum. Remember—basic material costs do not determine part costs. New techniques and processes—applicable only to aluminum—can often give you a better product at a lower final cost.



**REYNOLDS  
ALUMINUM**



# IF YOU MAKE

## ALUMINUM FABRICATED OR DIE CAST PARTS

# YOU NEED

## MACCO ALUMINUM CLEANER 19 JMA

### CHEMICALLY NEW APPROACH GIVES YOU A BETTER CLEANING JOB AT LOWER COST

Whether you are finishing fabricated sheet aluminum parts or die castings you'll get the chemically clean surface you need for the most effective subsequent operations when you use MACCO ALUMINUM CLEANER 19 JMA. This is not just another cleaner, but a specially developed compound that works like nothing else ever has. There are a number of reasons why—will not attack the metal . . . effective on a great variety of soils . . . eliminates streaking or water spotting . . . more economical to use . . . rinses freely, less contamination of rinse water . . . low pH, safer to use . . . works as well in tanks as in pressure washers. Your Macco man will be pleased to give you all the facts about MACCO ALUMINUM CLEANER 19 JMA. Then you be the judge!



BOATS, REFLECTORS, EXHAUST FAN HOUSINGS, ROOF SHINGLES, AIRCRAFT STRUCTURAL PARTS, APPLIANCE NAMEPLATES, VACUUM CLEANER HOUSINGS — MACCO ALUMINUM CLEANER 19 JMA will do an outstanding job on all of them, and more besides.

**THE METALWORKING INDUSTRY LOOKS TO MACCO FOR LEADERSHIP**



**MACCO**  
PRODUCTS COMPANY

9233 S. SANGAMON ST., CHICAGO 20, ILLINOIS  
PRESCOTT 9-0800

## NEW FROM WILCOLATOR



Wilcolator has originated a new and simpler method of calibrating its Model G thermostats. In the event that it is ever needed, field calibration can be accomplished faster and more accurately than ever before.

All that is required is that the dial be removed and the setscrew adjusted in the hollowed center shaft. No disassembly of the thermostat is required, since adjustment is made from the front. This easier method

of field calibration not only makes greater accuracy possible, but saves valuable time for all concerned.

Wilcolator G thermostats, both single and double pole, are the highest rated, most compact low-cost thermostats on the market. They are designed for every heating and cooling application and are UL listed and approved.

Write today for complete information on the Wilcolator line of G controls.

*Thermostats for Every Heating and Cooling Application*

**THE** Wilcolator  
COMPANY

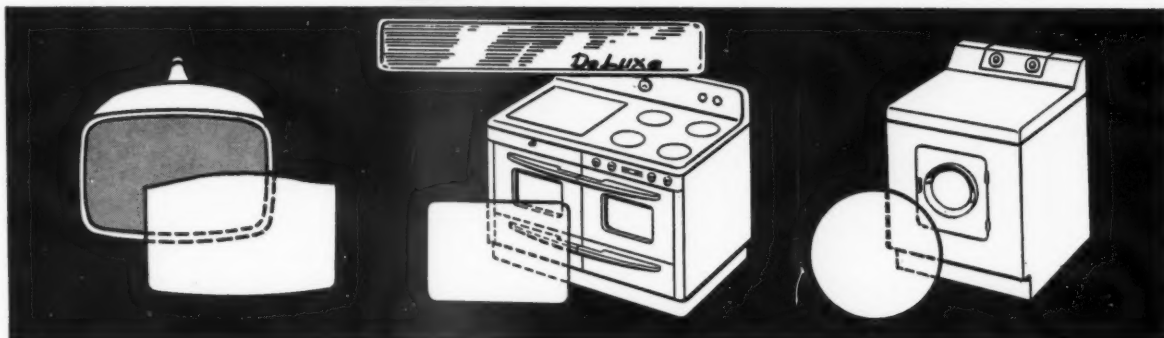
THE WILCOLATOR COMPANY  
1001 NEWARK AVE., ELIZABETH, N. J.

Subsidiaries and/or affiliates in  
Canada, Great Britain, Italy, Western Germany, and Australia



# MARSCO

## *Glass*



for TELEVISION • MODERN RANGES • WASHING MACHINES

*Let MARSCO'S Craftsmen-Engineering Team*

IMPART TO YOUR PRODUCT ALL THE ADVANTAGES OF GLASS

*Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:*

- CLOCK & TIMER CRYSTALS
- OVEN DOORS
- RADAR EQUIPMENT
- AIRCRAFT ACCESSORIES
- PHOTOGRAPHIC EQUIPMENT
- LIGHT LENSES
- DIALS & NAME PLATES
- TELEVISION EQUIPMENT
- INSTRUMENTS
- MEDICAL EQUIPMENT
- BACKGUARD GLASS FOR RANGES
- LAMP GLASS
- SHELVING

*Special Shapes for: Instruments, Gauges, Household and Industrial Appliances.*

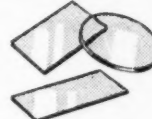
*Marsco*



Bent Glass



Convex Glass



Heat-treated Glass

**MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.**



you need a **PROCTOR** on your range



**THE PROCTOR FLASHER INFINITE** wins every heat! Flasher action gets cooking off to a fast start; Infinite control sets a steady, even pace for a smooth, prize winning finish. Housewives love this championship performance. ➡ **PROCTOR** Electric Range Controls eliminate many installation hurdles—there are fewer connections and less wiring. ➡ Be a pace-setter in the electric range sales race. Equip your ranges with blue-ribbon-winning **PROCTOR** Range Controls.



**THE PROCTOR-SILEX CORP.**, Controls Div.  
4000 Coolidge Ave. • Baltimore 29, Md.



**PROCTOR**





## Christmas is for children!

*It's the day when everything is bigger, better and more beautiful than they ever dreamed it could be. Christmas is for children . . . yet we all share in the excitement, the joyousness, the good fellowship that's in the air.*

*Let's hold on to that Christmas spirit. For when we have more friendliness and more genuine admiration among men and among the nations of the world . . . we will have peace —a peace that will endure.*

50 YEARS OF RESEARCH AND A FLAME

**PEMCO** CORPORATION

BALTIMORE 24, MARYLAND

# Superior Pre-Paint Protection Racks Up More Sales,

## Paint Adhesion of Air Conditioning and Heating Registers, Grilles and Diffusers Insured by Granodine



Krueger management-manufacturing team: Left to Right—J. B. Smith, Vice-President of Production; President Leo Krueger; and Ted Kleckner, Vice-President and Comptroller.



Precision forming equipment turns coil stock steel into product at Krueger plant.

At major parts producer, Krueger Air Conditioning Corporation, registers, grilles and diffusers are treated with Amchem Granodine before painting to provide them with what Krueger officials agree is a "superior finish that extends the life of our products."

### FINISHING PROBLEM SOLVED

Before selecting Granodine as their standard phosphating treatment, Krueger had tried several competitive processes but were unable to sustain the final quality or eliminate rust from painted products. The results—customer complaints and rejects running up to 10 percent of total production.

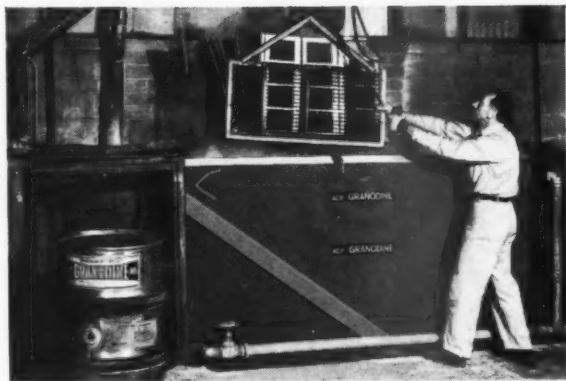
Today, after three years of utilizing Granodine in a five-stage dip phosphating process, Krueger, one of the world's largest manufacturers of registers, grilles and diffusers reports virtually no rejects, increased volume and an all-around better paint finish.

### COMPARISONS SELL

To tell their superior finish story Krueger sets up effective side-by-side demonstrations of untreated products and products treated with Granodine at heating trade shows. Customer interest in such displays is high and has led to more sales through

# of Amchem GRANODINE\*

## Fewer Rejects For Krueger



Operator employing electric hoist, lowers load of Krueger products into Granodine dip tank.



Paint line conveyor carries painted Krueger products from water-washer spray booth to inspection area.

graphic illustration of competitive advantages on Krueger's part.

Further support comes to Krueger through the use of Granodine when bidding for and successfully securing Government contracts and projects involving architects where rigid specifications exist for pre-paint finishing.

### NEW SYSTEM PLANNED

Looking to the future, Krueger—with a 400 percent increase in sales over the last six years—is currently adding a new 10 acre, 100,000 square foot plant. High on the planning list is a new and virtually completely automated Granodine line. Amchem engineers have designed a unique conveyorized system utilizing overhead cleaning, rinsing and coating of Krueger products which will achieve

significant cost savings and substantial reduction in gas consumption through a colder method in the clean-coat phase of the process.

If you are interested in a *superior finish* for steel products—it will pay you to investigate Granodine, the *superior phosphating* process. Your local Amchem Representative can supply the details on how you can quickly and conveniently make the switch to Granodine without interrupting production or re-designing processing facilities, while providing a substantial increase in quality of product finish!

Write for Bulletin 1380B  
containing detailed  
information on Granodine  
for steel . . . the finish  
that lasts.



\*Granodine is Amchem's registered trademark for the conversion coating chemical used to produce phosphate coatings on steel.

 **GRANODINE**

Amchem is a registered trademark of **AMCHEM PRODUCTS, INC.** (Formerly American Chemical Paint Co.)

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**MORE**

**"CREATIVE DESTRUCTION"**



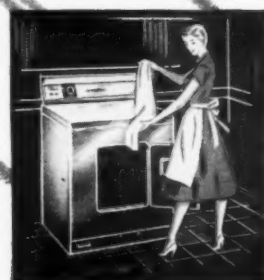
Each successful departure from conventional appliance design has added to the innovator's prestige and has stimulated the demand for his products.

So it was when the first built-in electric meat thermometer was introduced. Again, when signaling was added. More recently, when full automation made it possible to cook and hold a roast indefinitely at any selected degree of doneness.

These developments were spearheaded by King-Seeley's Appliance Control Specialists, whose chief aim in life is the "Creative Destruction" of the conventional—for greater market impact.



*How about a  
NEW CONTROL  
IDEA  
for your  
next model?*



**KING-SEELEY DIVISION**  
OF  
**KING-SEELEY, CORPORATION**  
ANN ARBOR, MICHIGAN





# Large and enthusiastic crowd attends AHLMA conference in San Francisco



View of group attending the 14th National Home Laundry Conference in San Francisco.

## AN MPM STAFF REPORT

A GROUP OF SOME 470 PERSONS attended the 14th National Home Laundry Conference held at the Fairmont Hotel in San Francisco, November 3-4. Officials felt this was an exceptionally fine registration considering the traveling distance required for most of those in attendance.

The conference was brought to order by Chairman Claire G. Ely of Maytag. He outlined the conference plan and introduced the "Alma" award winners. This year's winners, recognized for outstanding journalism in home laundry education, were Ginnie Erdmann, society editor for the Green Bay Press-Gazette, Green Bay, Wis.; Elizabeth Kirkendall, woman's page editor, The Pratt Daily Tribune, Pratt, Kansas; Marian Ingersoll, home editor of The News-Gazette, Champaign, Ill.; Roberta Mackey Rigger, The Detroit Free Press, Detroit, Mich.; and Wanda Wilson, home furnishings editor, Fort Lauderdale News, Ft. Lauderdale, Fla.

The first presentation on the program covered the changes that have taken place over "the amazing twelve years past!" The three elements of the pres-

entation were "The Fabrics of the Forties," by Frances Folsom, director, home economics institute, Hotpoint Co.; "Those Simple Solutions!" by Ruth Krustev, home service director, The Maytag Co.; "Wonderful Washers — then," by Jessie Cartwright, home service director, Norge Div., Borg-Warner.



Jessie Cartwright, home service director, Norge Div., Borg-Warner Corp., presents "Wonderful Washers — then."

"Industry Plain Talk," a round table discussion on recent new developments, was moderated by Guenther Baumgart, AHLMA president. One of the first subjects covered was the flexibility of laundry equipment. Jane Cornish, of *Good Housekeeping*, stated that she favors flexibility and wants a variety of cycles

in order to have freedom of choice. This plea was seconded by Maxine Livingston, of *Parents'*. Frank Lindsay of The Maytag Co. pointed out that it is the great variety of fabrics in existence today that caused the need for such flexibility. W. L. Hullsiek of Kelvinator stated that the manufacturers try to give flexibility but that there are always new problems because of new developments.

Maxine Livingston said that she is all for the combination washer-dryer. According to her recent survey, less service is required for the combo than for the washer and the dryer. It takes less space and can cost less than top-line sets of washers and dryers. She admitted that it takes longer to do the laundry but feels that this is quite all right as the homemaker can go about other tasks and does not have to bother with switching the laundry from the washer to the dryer. Virginia Habeeb of *The American Home* strongly seconded the vote for the combo.

Elizabeth Sweeney Herbert of *McCall's* asked the manufacturers what they were doing to improve service. Harlan Besse of Hotpoint stated that much progress has been made. He listed increased material testing, better design

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Wanda Wilson



Roberta Rigger



Marian Ingersoll

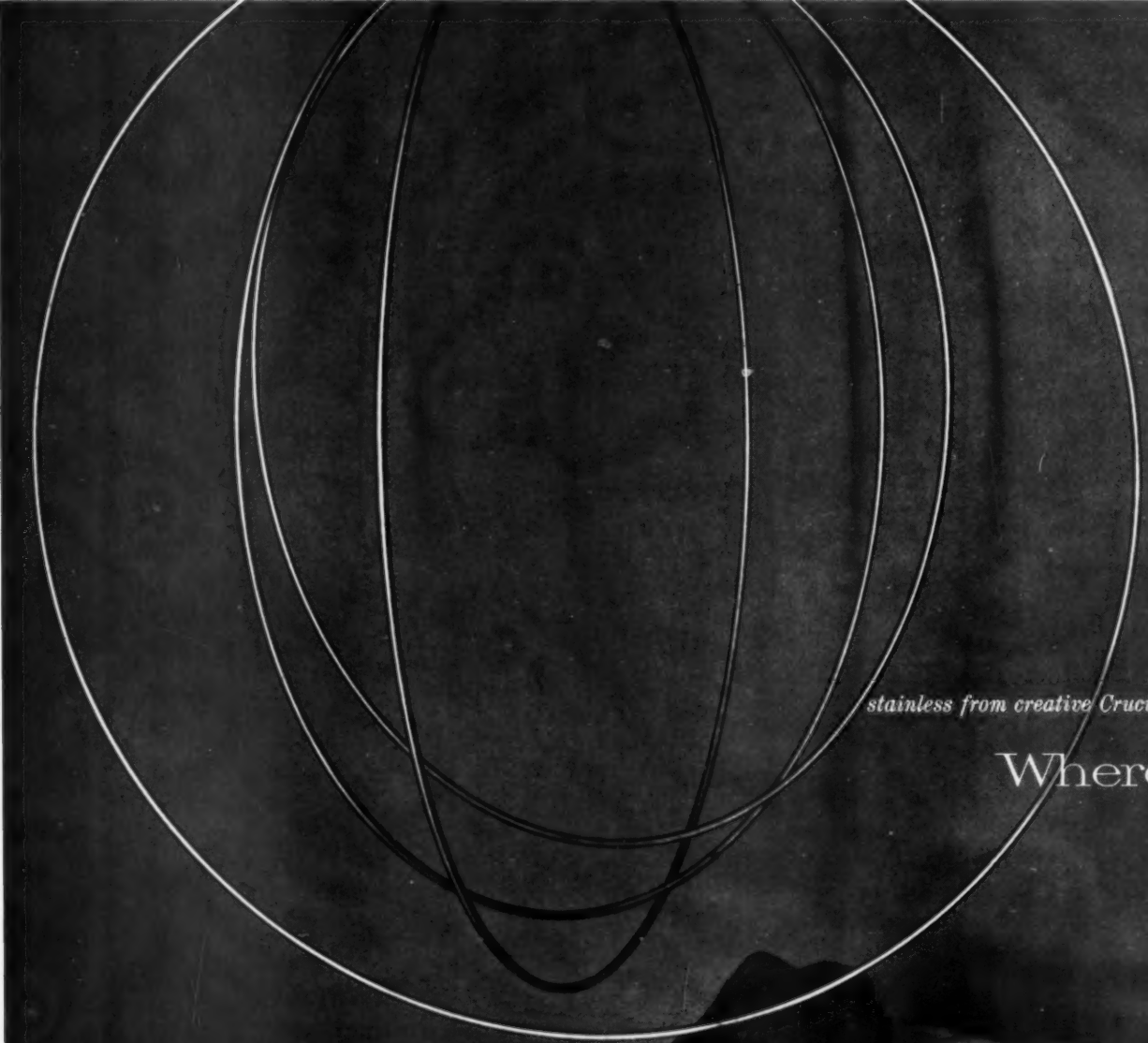


Ginnie Erdmann



Elizabeth Kirkendall





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# Interest high at 2nd west coast technical conference

AIEE-sponsored meeting draws 120 engineers

EXCLUSIVE MPM PHOTOS

## AN MPM STAFF REPORT

**A**N INTERESTED GROUP of some 120 engineers attended the second annual American Institute of Electrical Engineers' Western Appliance Technical Conference held at the Biltmore Hotel, Los Angeles, Calif. on November 7. The MPM reporter felt the papers were exceptionally informative and well presented. As evidence of the interest shown in the conference, most of the engineers in attendance devoted their undivided attention to the proceedings from 9:30 am to 9:20 pm.

The first paper in the morning session



Frank Breckenridge, O'Keefe & Merritt Co., moderated the panel discussion.

was "The Role of the Product Service Department in Product Design," by H. R. Clark, manager of customer service, Waste King Corp. He stressed the importance of having the product service department in close liaison with product design engineers. Field service reports pinpoint current bad service areas. Meetings between design engineers and product service personnel enable them to discuss the problems and develop solutions.

The second paper of the morning was "Reliability and its Relationship to Overall Quality," by Ray Sonderup, manager of appliance quality control, Philco Corp. He pointed out that since the advent of missiles, there has developed what he termed a "reliability concept." He made it clear that complete reliability was necessary in the missile area and that, while complete reliability wasn't essential in the appliance field, it was extremely important to have reliable products, and that reliability was an important part in forming the opinions of the consumer as to whether a product was a quality product—and of course all appliance producers desire to have their products recognized as quality products. He feels that the basic factors by which a consumer evaluates quality

are: (1) performance, (2) uniformity of measuring, and (3) reliability. If the product fails in one or more of these three requirements, it fails to meet the standards of a quality product.

Sonderup pointed out that quality problems become service problems and that there are three basic types of service problems: (1) problems which require a change of design to correct, (2) problems resulting from poor workmanship or defective material, and (3) problems that can be corrected only by user education. He pointed out that it is extremely important to determine which type of service problem is being encountered, so corrective action can be taken.

The third paper of the day was "Direct Spark Ignition for Gas Appliances," by Paul Neess, manager market research, Controls Corp. of America. Conventional automatic ignition systems for gas-fired equipment depend upon a pilot flame for the ignition of the main gas burner, and provide an electric "hot wire" or glow coil as the ignition means for the pilot flame. Gas utility service records show that the pilot burner and its companion glow coil igniter account for a disproportionate share of service complaints. Because of this problem, a great deal of time and money have gone into

Panelists discussing the subject, "What We Expect from an Appliance," are (from left): Pat Shea, Southern California Gas Co.; R. K. Cherry, Hadley-Cherry, Inc.; J. A. Stone, American Gas Association Laborator-

ies; Gerry Allen, Department of Water & Power; Dr. Gladys Stevenson, San Fernando State College; and H. E. Reymers, Underwriters Laboratories, Inc. This subject was followed by a floor discussion.







H. R. Clark, Waste King Corp.



Ray Sonderup, Philco Corp.



Paul Neess, Controls Corp. of America.



Raymond Goodman, Whirlpool Corp.



William Purcell, partner, Henry Dreyfuss.



S. K. Skafe, Utility Appliance Corp., chairman.



Herbert Leo, Utility Appliance Corp.



R. P. Abraham, Texas Instruments, Inc.



Karl S. Geiges, Underwriters' Laboratories, Inc.



John Smaxwell, General Electric Co.

research to develop apparatus that would solve this problem.

Nees pointed out the various component parts of the automatic direct spark ignition system, and how the system operates.

"Designing Two Appliances in One" was the last paper of the morning session. Raymond Goodman, manager, Kenmore dryer and washer dryer engineering, Whirlpool Corp., explained how they had gone about designing such an appliance—the 1961 Whirlpool combination washer-dryer. He stressed the fact that if he were to single out one theme that his company stresses, it would be, "Whirlpool builds appliances for the fuel of the customer's choice," which means they must design the appliance first and then apply the desired fuel. He pointed out various steps they had taken in carrying out this aim, and that they had ended up with a combination washer-dryer which is practically identical except for the heat source.

The luncheon speaker was William Purcell, partner in the Henry Dreyfuss industrial design firm, who spoke on the topic, "An Industrial Designer Looks at Appliances." He said his firm feels the primary function of industrial designers is to increase profits for their clients through the increased sales. He believes good design is based on logic, and they have developed a check list to follow in all cases: (1) convenience of use, (2) ease of maintenance, (3) cost, (4) sales appeal, and (5) appearance.

The Dreyfuss organization believes that good design is simplicity and order. Well-designed products must also be well-engineered. He stressed the fact that the designer and engineer should work together from the very beginning. He also emphasized that in redesigning a product, real values must be put into the product; a really worthwhile change should be made—not just a skin-deep treatment.

Presiding Chairman S. F. Skafe, Utility Appliance Corp., opened the afternoon session by introducing Herbert Leo, executive vice president and general manager, Utility Appliance Corp., who spoke on "Corporate aspects of Product Warranties." "Aside from some of the troublesome aspects of the mechanics of warranty service," he said, "the chief point of contention in present warranty practice is the duration of the warranty period—irrespective of the duration of the product warranty, manufacturers, distributors, dealers and consumers will all be well-served by reasonable uniformity of warranty practice within any segment of the industry.

"Pro-rated warranties, though protective of the manufacturer, should be used judiciously, and the period of pro-ration should not be excessive in relation to the unconditional portion of the warranty. Above all, warranties should be recognized as adding value to the

manufacturer's product, and sound business thinking forces the conclusion that any resulting increase in cost to the manufacturer must be considered in establishing selling prices. . . . Intelligent and thorough planning in establishing the program, together with skillful and timely action by the departments responsible for its execution and control, can make product warranties the valuable asset they should be."

The second speaker of the afternoon was R. P. Abraham, manager, device characterization and circuit development, Texas Instruments, Inc. His talk covered "Present and Future Applications of Semiconductor Devices in the Appliance Industry." He pointed out that these devices have far better reliability and speed than present mechanical devices; however, their cost is prohibitive. In the discussion period following his talk there was considerable debate as to whether the costs would ever be low enough for reasonable practicality for the appliance industry. Abraham's opinion was that in a period of three or four years there would be applications where this might be the case.

The next to last speech for the afternoon was "Production Testing for Electric Shock Hazard," by Karl S. Geiges, vice president, Underwriters' Laboratories, Inc. He summarized his talk by stating, "Production testing for electric shock hazards is an increasingly important tool for industry, as it enters an era where electricity is an essential part of everyday life. Automation, new conditions of field use, new voltage levels, and new materials will combine to require more consideration of safety in design and production testing if we are to fulfill the obligations that go with this increased use of electrical equipment."

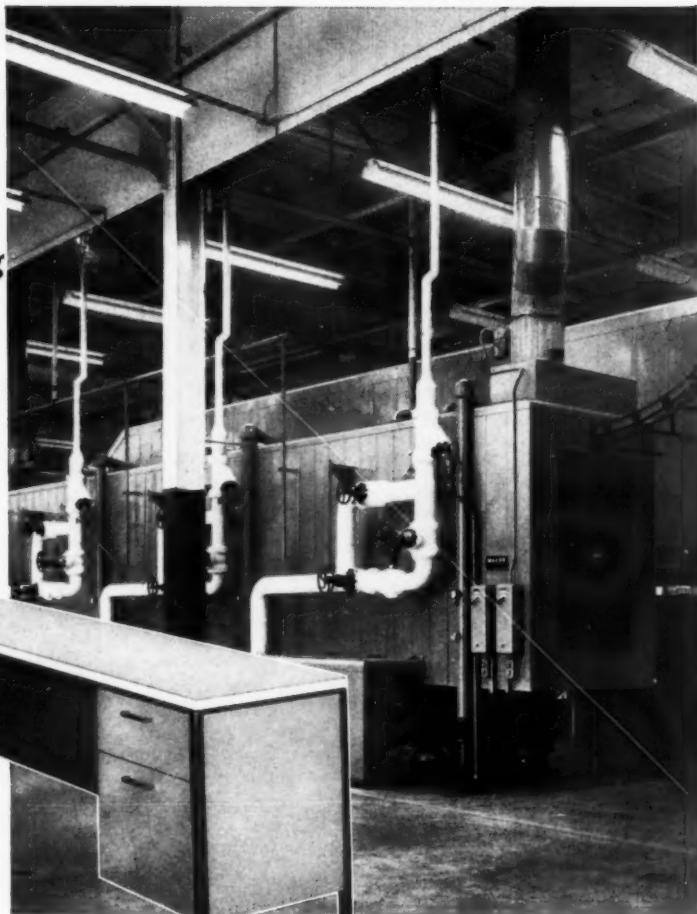
The final paper of the afternoon was "Application of Shaded Pole and Permanent Fixed Capacitor Motors to Direct Driven Blowers," by John Smaxwell, engineer, components applications, General Electric Co. Smaxwell briefed a complete paper on the subject, and contributed a great deal toward a better understanding of the difference between these two types of motors, their limitations, and their best applications.

After dinner, a panel discussion moderated by Frank Breckenridge, president, O'Keefe & Merritt Co., covered the subject, "What We Expect from an Appliance." The panelists included Gerry Allen, Dept. of Water & Power, Los Angeles; R. K. Cherry, Hadley-Cherry, Inc., Los Angeles; H. E. Reymers, Underwriters' Laboratories, Inc., Santa Clara; Pat Shea, Southern California Gas Co., Los Angeles; Dr. Gladys Stevenson, San Fernando State College, San Fernando; and J. A. Stone, American Gas Association Laboratories, Los Angeles. Each gave his opinion as to what should be expected of an appliance and from the appliance industry in general. —MPM

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**fine office  
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below: one of GF's new 1000 Series desks, part of a striking, new functionally designed business furniture line. At right: a stage of the complete finishing system designed and built by Mahon for GF's San Luis Obispo, Calif. plant.



Production finishing is the application of coatings of a specified quality at highest efficiency. That also sums up the business of Mahon's Industrial Equipment Division and they have learned it well . . . for over forty years . . . in hundreds of installations . . . for all types of finishing. Mahon metal-cleaning and metal-finishing systems will prove your best investment regardless of initial cost. In this highly specialized, multi-process area, can you afford less than the best for your quality products? Find out how Mahon's 'finishing touch' can improve your products . . . your costs . . . your sales. Call in Mahon.

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# MAHON

# Industrial designers hear pro and con on annual model change

## WHY PRODUCT CHANGE?

**B**LACK, WHITE AND GRAY opinions on the question of annual model change livened the recent annual conference of the American Society of Industrial Designers.

Participating in the discussion of this controversial topic were American Motors President George W. Romney, James M. Toney, vice president, product planning and development, RCA Sales Corp., and Dr. Reavis Cox, former president of the American Marketing Association and now professor of marketing at Wharton School, University of Pennsylvania.

Other sessions of the two-day Chicago meeting explored the contributions that industrial design can make to corporate profitability. Representatives from Italy's Olivetti Corp. illustrated and explained how their firm integrates design and marketing for the broadest possible customer impact. A program presented by Aluminum Co. of America — "A Lesson in Marketing Integration" — detailed the company's efforts to create a unified marketing program.

Led by ALCOA President Frank L. Magee, company personnel explained a marketing approach that has integrated product design, promotion, sales, advertising, architecture, corporate image work, public relations, point-of-purchase and graphics material, and even aid to education. Of primary interest to the designers was an explanation of how industrial design contributes to all visual aspects of the company's work, and the close tie-in between industrial design and the sales program.

Olivetti executives reviewed the company's history and policies and presented examples of its use of design in products, architecture and advertising. In addition, they spelled out the techniques Olivetti has used in inventing, projecting and protecting its corporate image.

### The annual model change

Romney, champion of the forces opposing calendar-dictated model changes, led off the three-way discussion of model change and artificial obsolescence. Pinpointing his remarks to the audi-



Dr. Reavis Cox and James M. Toney listen as George Romney answers question in discussion session following the panel's presentation on the topic of annual model change.

ence, he said that the annual model change interferes with the industrial designer's job and often results in "styling abortions."

An additional result of the forced model change, he added, is to take ultimate economic power away from the customer. "... too much of the touted technological and persuasive skill in this country today is devoted simply to producing and selling something different, without sufficient regard for the inherent usefulness and worth of what we are selling."

Stressing the "pursuit of excellence" and "appearance stability and continuity," Romney said that many industries, including appliances, have followed the lead of the automobile industry, which originated the practice of annual model change. "The attempts by other industries to duplicate what happened in the early days of the automobile industry has caused some of today's problems. Now, attempts to forcibly outdate products that are meant to have a long and useful life by changing them capriciously every year are being questioned by the consumer with increasing intensity."

Turning to the consumer's viewpoint, Romney explained that a product's worth may be expressed in several ways, including initial price, cost of upkeep, frequency of replacement, trouble-free performance, ease of upkeep, satisfaction of wants based on either necessity, convenience, esthetic satisfaction, or pride of ownership. Depending on the product, he added, a variety of combinations of these benefits are possible.

"Our success in balancing these factors will be determined by the decision

of the consumers in the marketplace — and the experience of our economy indicates that, when the consumer has a free and adequate choice, he will make the right decision."

### A voice in protest

Following Romney, RCA's Toney went to the podium and expressed a somewhat contrary view. Emphasizing that he was speaking only for the home entertainment industry (radio, television, etc.), Toney led off his talk with a denial that the consumer's wants can be manipulated. "Anyone who believes a manufacturer can force the consumer to buy something he doesn't want hasn't spent time on a dealer's sales floor. Anyone who thinks he can stay in business and prosper without keeping up with competition is fighting a losing battle."

He expanded his argument by noting that "the home entertainment industry is coming up with more than enough important new developments each year to make the annual model change profitable for both manufacturer and consumer."

Toney named several innovations that he considered worthy of warranting annual model changes, including the transistor and the 100 milliamper tube. He also mentioned the trend toward finer furniture styling in television and stereo.

Other factors which make the annual model change desirable in the home entertainment industry, according to Toney, are lower cost components or manufacturing methods, tooling fatigue, and the demands of competition.

Finally, he said, the "psychological

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Exhibits at annual NAMA convention covered almost 100,000 square feet.

## Automatic merchandising toasts 75th anniversary

**NAMA's 14th convention-exhibit draws 600 to Miami Beach**

**T**HE 14TH ANNUAL convention-exhibit of the National Automatic Merchandising Association in Miami Beach, October 28-November 2, kicked off a year-long celebration of the 75th anniversary of the automatic merchandising industry in the United States.

The meeting, called the largest in the organization's history, drew a registration of close to 6000 vendors. In addition, 145 exhibitors displayed their products in an area covering almost 100,000 sq. ft.

According to Thomas B. Donahue, president of NAMA, the chief purpose of the anniversary celebration is to demonstrate "how vending serves the public." Anniversary events, all under the direction of NAMA, will include the establishment of a national library on automatic merchandising, the publication of a history of vending, an international vending symposium, possible issuance of a commemorative postage stamp, extensive speaking efforts before national groups about the vending industry, and the use of cooperative advertising in national magazines to portray the service rendered by vending.

The home-town part of the anniversary program will feature a series of simultaneous local "automatic merchandising weeks" next spring, including open houses, exhibits, talks before clubs, schools and civic groups, proclamations by mayors and governors and similar events.

The "vending library," which will be established at St. Louis University, St. Louis, Mo., will contain a complete library and collection of publications on automatic merchandising. An initial donation by Donahue of \$5000 will be used to acquire and maintain an industry-wide book collection, including the retailing applications of automatic mer-

chandising, history of the industry, the manufacture of machines, and other technical phases. A complete collection of the industry's trade journals will also be a part of the library.

The major address at the meeting was presented by Herb A. Geiger, 1st vice president of NAMA. In his talk, "Are You Ready for Vending in the Sixties?" he said that the recent operating company mergers into national organizations will benefit the industry as a whole, as well as the alert independent businessman. He stressed that the independent vending operator will continue to perform a service which is competitive with the national operators.

"Many of these mergers and the issue of stocks have changed the public awareness of vending," he said. He predicted more mergers of operating companies in the months to come and offered these tips to companies who must choose whether to join or compete: "You know

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(Left) — Thomas B. Hungerford discussed the work of the association in the past year and the challenges faced in the future.



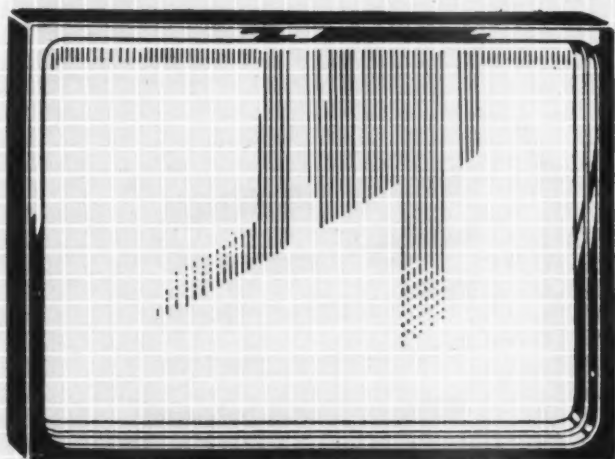
(Right) — Herb A. Geiger, NAMA first vice president, discussed "Are You Ready for Vending in the Sixties?"

(Below) — Participating in the ribbon cutting ceremony to open the convention were (left to right): John P. Pero III, Pero Associates, New York City; Thomas B. Donahue, NAMA president; Berton Steir, Automatic Merchandising Corp., Medford, Mass.; Mrs. Fleming W. Conyers, Kwik Kafe of North Florida, Inc., Jacksonville, Fla.; David D. Dayton, Tennessee Service Co., Inc., Knoxville, Tenn.; and Thomas B. Hungerford, NAMA executive director.





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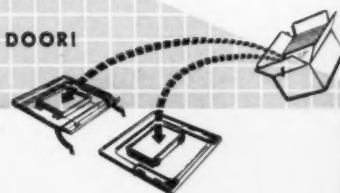
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## THE MPM . . .



**STAINLESS STEEL** by ALLEGHENY LUDLUM STEEL CORP. was used in this Thunderbird, parked against a background of stainless steel buildings. The car was made for Allegheny Ludlum of stainless from a regular production run, and on regulation production dies by The Budd Co., fabricators of Thunderbird bodies. Purpose in making the special body was to display the long lasting appearance of stainless steel, and also to show the ease of fabrication.

(BELOW) — **DROP-IN ELECTRIC RANGE** by WASTE KING UNIVERSAL combines oven and surface cooking elements in one compact unit. The entire one-piece unit with 19-inch oven and four heating elements can be built into a two-foot cube. The Custom model comes in a choice of white, coppertone, canary yellow, petal pink and turquoise green porcelain enamel.



**CHROMALOX ELECTRIC UNIT HEATER** by EDWIN L. WIEGAND CO. is designed to solve space heating problems in factories, public buildings, stores, garages, warehouses and other similar establishments. Designated, Type LUH, the heater has a metal sheath Chromalox Fintube electric element with built-in line voltage overheat protection. Fan motor is totally enclosed, has thermal overload protection.

(RIGHT) — **EPICURE, 40-INCH GAS RANGE** by GEO. D. ROPER SALES CORP., features the re-introduced "Staggered" top. Available in bronze porcelain or lifetime white enamel finish, the range makes maximum use of cooking top space. The model also offers full top burner, oven and broiler capacity, automatic three-way lighting, and new low-temperature warming oven. Other features are Tem-Trol automatic top burner and Comfort-Level broiler.



## FOTO-NEWS

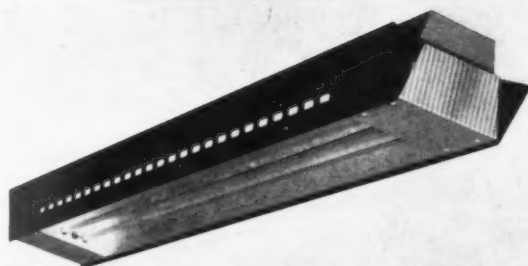


**MAXIMUM SECURITY CHANGE-MAKER** by STANDARD CHANGE-MAKERS INC. features heavier cabinetry, "common-front" design, interchangeable units, and cartridge loading. Constructed of 3/16-inch steel with a quadruple locking mechanism, it eliminates the need for a vault or other protective device, even though placed in an unattended location.

**(BELOW) — HEAT PUMP** by MUELLER CLIMATROL is a two hp, self-contained unit only 36 inches long, 31 inches wide, and 20-5/16 inches high. It develops 21,000 Btu/hr. heating and 22,000 Btu/hr. cooling. Supplementary electric resistance heating packages are available.

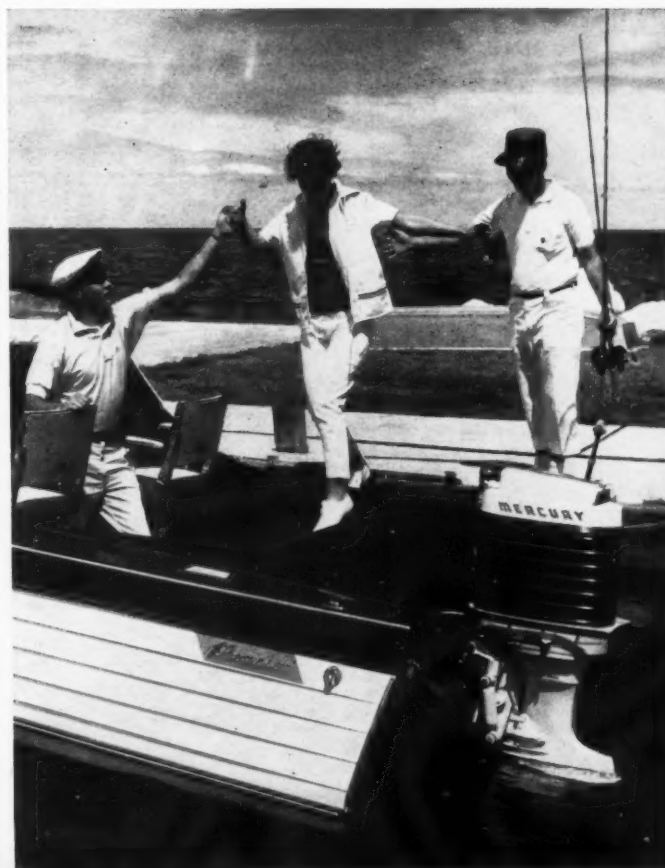


**(RIGHT) — ELECTRIC TYPEWRITER** by REMINGTON RAND is available in six shades, beige, gray, green, coral, yellow and blue. An important feature is a new carriage suspension design, a cushioning system which produces a light, fast and responsive touch. Over 100 type styles are available, and hundreds of special symbols can be adapted, from chemistry and electronics to law and mathematics, through the use of interchangeable type.



**(LEFT) — INFRA-RED COMFORT HEATER** by FOSTORIA CORP. creates comfort conditions in hard-to-heat indoor and outdoor areas. The heater transfers radiant energy directly from source to object without heating of the intervening air.

**(RIGHT) — MERCURY OUTBOARD** by KIEKHAEFER CORP. has 80 horsepower, full gear shift lower unit incorporating forward, reverse and running neutral. It has a six cylinder engine, single-lever remote control for one-hand operation, and an exclusive Jet-Prop drive fires exhaust sound and fumes into the center of the propeller slipstream.





# Season's Greetings



**THE O. HOMMEL CO.**  
PITTSBURGH 30, PA.

West Coast — 4747 E. 49th Street, Los Angeles, California



MPM-T260



## THE MATHES HEAT PUMP

**T**HE ULTIMATE GOAL of The Mathes Co.'s heat pump engineering department is "to design a unit which will, without a doubt, perform its task as defined by the industry, to the complete satisfaction of the ultimate user, in any climatic conditions in which it may be used."

The result of this philosophy is on mass display at Little Rock Air Force Base, Little Rock, Ark., and at Seymour Johnson Air Force Base, Goldsboro, N. C. Mathes remote-type heat pumps installed at these bases — 1547 at Little Rock, and 1500 at Seymour—are representative of the design the company offers the average home owner. These installations are said to be the two largest in the nation.

According to Ed Schwartz, vice president, engineering, there are several



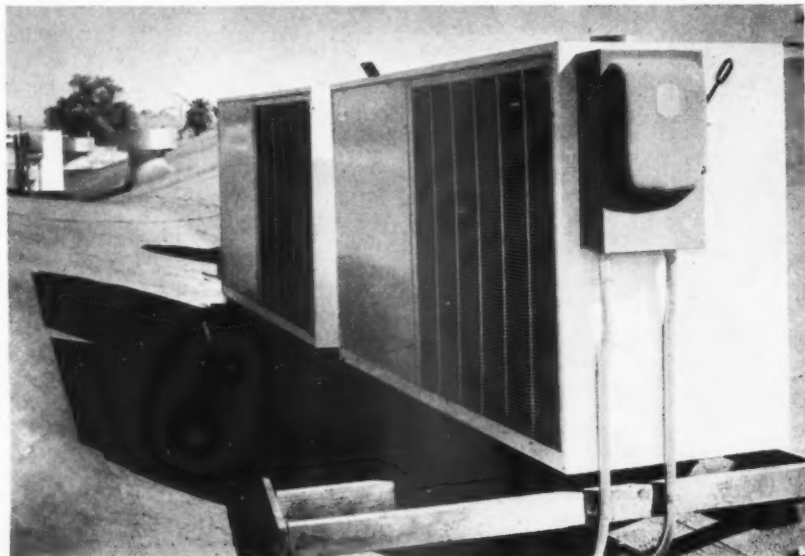
Model 1050D heat pump.

## Pumping heat the Texas way

"musts" that guide the engineering and design of the company's heat pumps: the unit must be pleasing in design, quiet in operation, reasonable in cost, and designed for preventive maintenance.

All of these "musts" necessitate a vast amount of experimental design, development and testing on the part of Mathes engineers prior to the assembly line production of the firm's heat pump line.

Mathes commercial indoor, air-to-air air source, split system heat pumps installed in a bowling alley in Phoenix, Ariz. Total capacity is 55 tons with four 10-ton remote condensing units on roof, and one 10-ton and one 5-ton condensing unit located on ground at end of building. Industrial sections are evaporator blowers suspended from ceiling joists.

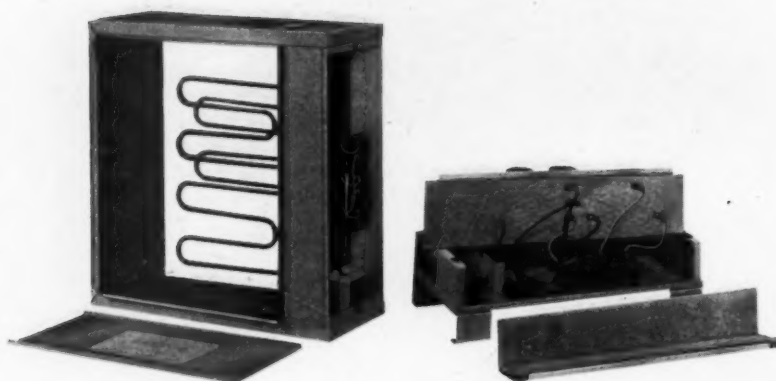


Mathes, a division of the Glen Alden Corp., is located in Marble Falls, Texas. The critical climatic demands of the Mathes trade area have necessitated metal finishing that withstands all climates — even the Gulf Coast.

All metal (cold-rolled and galvanized) used in the fabrication of Mathes equipment undergoes a five-stage cleaning and phosphatizing treatment. Following this operation the metal is primed with an epon urea vehicle, and catalyzed and pigmented with zinc chromate. The top enamel coat is an alkyd vehicle fortified with melamine and pigmented with titanium dioxide and toner pigments. This deliberate metal processing practice employs rigid specifications of solution temperatures, submersion times, coat thicknesses, oven temperatures, and baking times.

Galvanized steel is used in base pans and any other point where there will be continuous moisture conditions. The balance of the sheet metal parts are of cold-rolled, such as the cabinet, electrical boxes, fan shrouds and motor supports.

The heat pump equipment is designed to maintain optimum system balance and insure maximum capacity by use of the capillary tube. The capillary tube is used to meter the refrigerant into the



Strip heater used for supplemental heating.

evaporator or "cold" side of the system in the optimum quantity as required for proper and efficient operation. As the load changes due to varying temperature conditions of the indoor and outdoor ambients, the pressures of the refrigerant system change. The capillary tube meters the refrigerant and is dependent on these pressures to force more or less refrigerant through it.

Mathes feels it has proven the performance advantages of oversize heat-transfer surfaces, resiliently mounted pre-lubricated blower motors, a refrigerant strainer-dryer and a "dry eye" for inspection, "high-efficiency" air filters, and "full density" insulation.

All parts of the firm's air conditioners and heat pumps, with the exception of compressors, motors and electrical components, are fabricated at the Mathes plant in Marble Falls. Coil surfaces are made of pre-cut copper tubing

and rolls of special rippled aluminum fin stock. The tube expansion process, after tubes are in place, provides 100 percent mechanical bond between fin and tube, creating a direct path for heat flow.

Each model or size of heat pump has a pair of coils designed and sized specifically for that unit. There are some cases where the same coil is used on more than one unit, but only where standardization can be effected with no reduction in optimum performance and efficiency. The four complete lines of coil fabrication machinery afford a choice of sizes in  $\frac{1}{2}$  or  $\frac{3}{8}$ -inch tube, in two, three, four or five rows deep, and in heights of 12 to 40 inches. Lengths up to 80 inches are possible.

This versatility gives the design engineers a free hand to custom design the coil to meet the needs of the heat pump system. MPM

## Industrials designers

→ from Page 25

marketing factor" is probably one of the most important considerations in favor of the regular product change. "We find it is important that salesmen have something new to sell — some new feature to talk about — some reason that the new set is better than last year's."

In summary, Toney stated: "We at RCA are convinced that the annual model introduction is the best for us under the special conditions in our industry and we plan to continue it. We also are convinced it is the best policy for our customers — in fact, we believe they demand it."

### The scholastic view

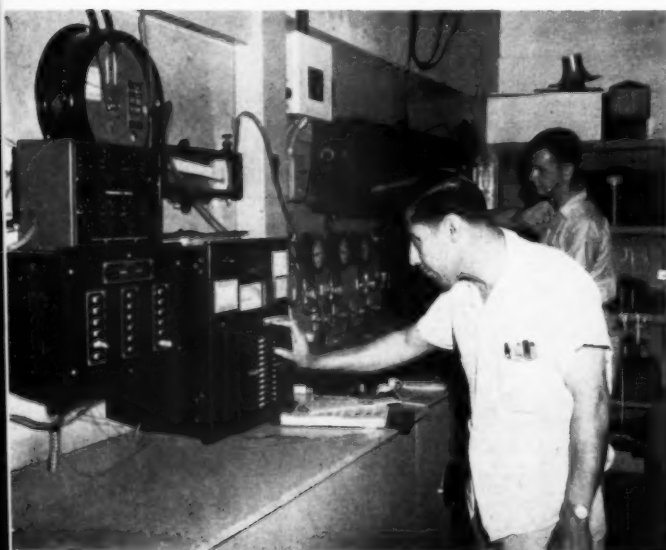
Taking "a look from the sidelines," as he described it, Dr. Cox offered the opinion that both critics and defenders of the annual model change were probably overstating their case.

He called for a systematic search to learn concrete facts surrounding this issue. Dr. Cox would like to know how many companies really engage in planned obsolescence and how important are the products with which they work? How much effect does what they do with new models really have on the purchase cycles of consumers? Are any considerable number of products really discarded by consumers before they are used up? What becomes of the discarded items? What becomes of the materials in them? Precisely what is frequent changing of models doing to our natural resources?

Touching on some of the arguments raised by each side on the question, Dr. Cox said neither is wholly accurate. For example, defenders of the annual model change say this practice is necessary to keep the economy operating at a high level. To this argument Dr. Cox replies, "... they seem to think of the consumer as being someone whose primary responsibility it is to keep the economy going rather than the one for whose satisfaction the economy exists."

As to the critics' contention that annual model change induces lack of thrift in consumers and wastes the resources of the economy, Dr. Cox said, "They attribute to sellers much greater powers of persuasion and control than they actually have."

"I should like to see some business or professional group," he summarized, "sponsor a systematic search for these facts. It would certainly help those like myself who are exposed continually to a blast of ill-informed criticism but have very little valid information with which to combat it." MPM



One of the main control stations in the engineering testing laboratory has a potentiometer capable of showing the temperature of any desired point in the test unit or controlled test space. By means of selector switches, it is possible to get any one of 169 readings by the "flip of a switch." Compound pressure gauges, draft gauges and a continuous recording potentiometer are also used along with a special instrument called an inclinometer. This device measures the pounds per hour of air flow in the test unit, and makes automatic compensations when adjusted to allow accurate readings for barometric pressures and temperatures.

*Another new development using*

## **B.F. Goodrich Chemical** *raw materials*



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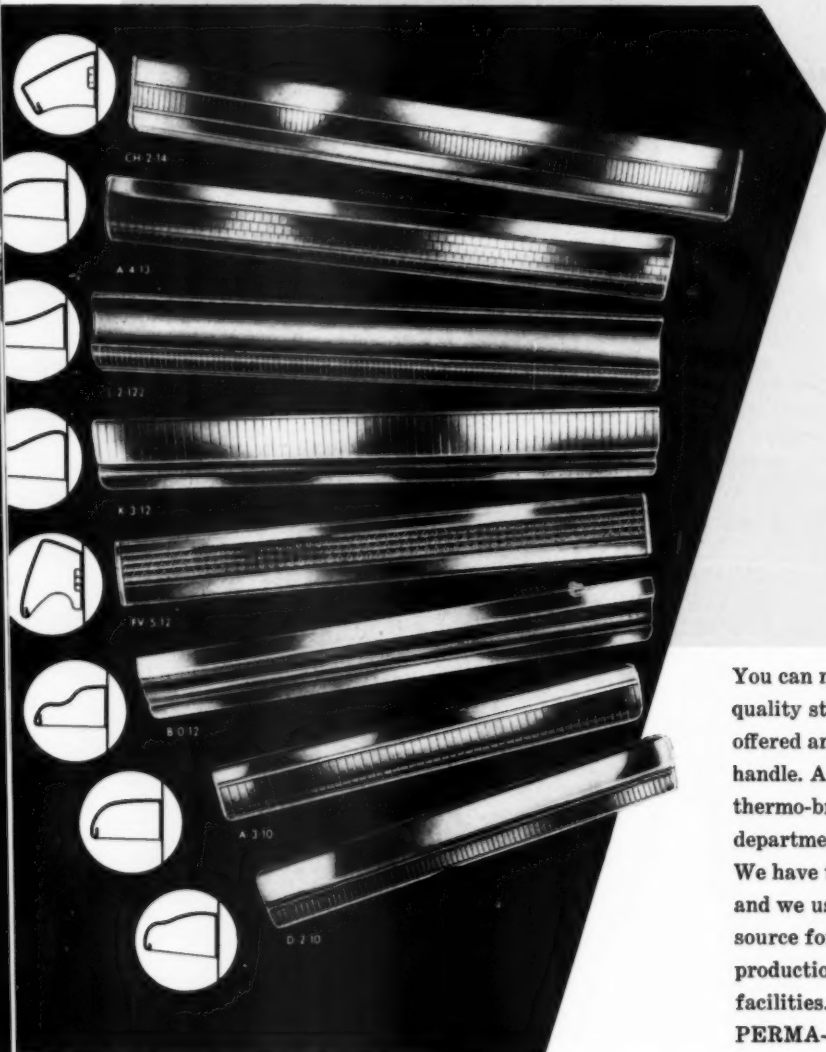
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The O'Keefe & Merritt range shown at the right is equipped with PERMA-GRIP door handles. It is also equipped with the universally accepted PERMA-VIEW oven door window, another engineered product of Mills Products, Incorporated.



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# Fabricating the aluminum base alloys

by Lester F. Spencer • METALLURGICAL ENGINEER

## PART III WELDING (CONCLUSION)

**D**UE TO THE INHERENT characteristics of the aluminum alloys, the technique employed in the resistance welding of these alloys will differ from that employed in the joining of steel. One factor is electrical conductivity; this value being much higher than that experienced with many other materials. Thus, the conductivity of 2024-T is three times the conductivity of low carbon steel; this necessitating the use of welders of higher capacity that are capable of supplying the larger welding currents required for aluminum. Another factor is that these alloys have no plastic range which requires a precise control of the energy input. In addition, the shrinkage experienced, especially in the high-strength, heat-treatable alloys, must be compensated for in the welding set-up; the necessity of removing the thin oxide coating that forms quite readily on the surface of these alloys must be done prior to welding; and, the tendency of these alloys to alloy with the copper within the electrodes which requires frequent cleaning and reshaping of the electrodes, rigid electrode set-ups, efficient electrode cooling, and improved electrode design. Although the welding characteristics of the various aluminum alloys will vary, all of these alloys can be spot and seam welded. (See Table 1).

General comments as to resistance welding of the three main groups of aluminum alloys are given, thus:

1. The high-tensile alloys (2017, 2024, 7075) are easier to weld since they have less tendency for sheet separation and show better weld strength consistency. However, they tend to develop more cracks and porosity.
2. The low tensile alloys, such as 1100 and 3003, are the opposite in that there is relative freedom from cracks and porosity, but have more surface indentation and sheet separation with inconsistent weld strength.
3. Those alloys that have a cladding of pure aluminum are more difficult to weld due to the low resistance, high melting point surfaces at the contacting interfaces, which tends to decrease weld strength consistency.

Although precleaning, and the removal of the thin oxide layer prior to resistance welding, is recommended to obtain consistently-high-strength welds, this practice is not always used on lightly-stressed, non-critical structures. The decision of surface preparation is entirely determined on the basis of the end use. Where an oxide film must be penetrated, the weld strengths may vary as much as 100 pounds in shear, the surface appearance of such spots may be poor, and both interfacial and surface expulsion of molten metal may occur due to erratic contact resistance. In addition, a single spot weld is not reliable, and any such joints should include two or more spots to provide some measure of reliability. However, where weld consistency is required, as exemplified in critical applications in aircraft, surface preparation is essential. Chemical procedures are preferred over mechanical methods; however, to obtain maximum effectiveness, it has to be under precise control. Details as to procedures recommended can be obtained from the major aluminum producers.

Both alternating current, magnetic energy storage, and condenser energy storage equipment are employed; the latter two types being the more frequently used. The aluminum alloys have a high heat conductivity and a low resistance which precludes that the weld must be made quickly if heat losses are not to be excessive. Since there also is a rapid softening of the material, a slight movement of the electrode into the material weld is required. Thus, to obtain the required acceleration of the electrode assembly to maintain contact, this system should possess low inertia, and should be so guided as to minimize friction.

Due to the high welding currents employed in welding this material type, the use of precision electronic controls is essential. Only slight variations exist in the length of time current will produce an extremely-large variation in the total heat input to the weld. All stored energy machines are provided with such controls and, in the event that alternating current welders are employed, precision electronic controls should be installed before attempting to weld aluminum if optimum strength and consistency are expected.

Both the amount of current and tip force (See Table 2) will be a function of the thickness of the material to be

Table 1 — Weldability Ratings of Aluminum Alloys for Spot Welding

Alloy	Elec. Cond. %	1100 -0	1100 -H18	3003 -0	2024 -0	6053 -0	6061 -0	2017 -0	3003 -H14	5052 -0	3003 -H18	5052 -H34	6053 -T6	5052 -H38	6061 -T6	2017 -T4	Alclad 2024 -T4
		Bottom Sheet															
t top*		1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3
t bottom		1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
1100-0	59	baa	bdd	bad	bdd	aaa	aaa	add	aad	add	add	add	add	add	add	ade	abc
1100-H18	57	baa	baa	bab	baa	aaa	aaa	aaa	aaa	aaa	aaa	add	add	add	add	abc	abc
3003-0	50	baa	baa	baa	bdd	baa	baa	bad	aaa	aad	add	add	add	add	add	abc	abc
2024-0	50	baa	baa	baa	baa	baa	baa	bad	aaa	aaa	aaa	aad	add	add	add	abc	abc
6053-0	45	cba	cba	baa	baa	baa	baa	bad	baa	aad	aad	aad	add	add	add	add	add
6061-0	45	cba	cba	baa	baa	baa	baa	bad	baa	aad	aad	aad	add	add	add	add	add
2017-0	45	cba	cba	baa	baa	baa	baa	baa	baa	aaa	aaa	aad	add	add	add	add	add
3003-H14	42	cba	cba	baa	baa	baa	baa	baa	baa	bad	baa	bad	bdd	bdd	bdd	add	add
5052-0	40	cba	cba	cba	cba	baa	baa	baa	baa	baa	baa	bad	bad	bad	bad	aad	add
3003-H18	40	cba	cba	cba	cba	baa	baa	baa	baa	baa	baa	baa	baa	baa	baa	aad	add
5052-H34	40	cba	cba	cba	cba	baa	baa	baa	baa	baa	baa	baa	baa	baa	baa	aaa	aaa
6053-T6	40	cba	cba	cba	cba	baa	baa	baa	baa	baa	baa	baa	baa	baa	baa	aaa	aaa
5052-H38	40	cba	cba	cba	cba	baa	baa	baa	baa	baa	baa	baa	baa	baa	baa	aaa	aaa
6061-T6	40	cba	cba	cba	cba	baa	baa	baa	baa	baa	baa	baa	baa	baa	baa	aaa	aaa
2017-T4	30	cbb	cbb	cbb	cbb	cbb	cbb	cbb	cbb	caa	caa	caa	caa	caa	caa	baa	baa
Alclad 2017-T4	—	cbb	cbb	cbb	cbb	cbb	cbb	cbb	cbb	cba	cba	cba	cba	cba	cba	baa	baa
2024-T4	30	cbb	cbb	cbb	cbb	cbb	cbb	cbb	cbb	caa	caa	caa	caa	caa	caa	baa	baa

\* Sheet Thickness Ratio - 1 to 3; 1, and 3 to 1.

NOTE — Bottom sheet represents horizontal row - no indentation, use large flat electrode. Top sheet represents vertical row - maximum or total indentation, use domed electrode.

LEGEND — a is good; b is fair where difficulties may be encountered under certain conditions; c is poor; d is fair, severe indentation and sheet separation must be expected.



## New Lead Development Adds

# PEARL

## To Appliance Finishes

The oyster can simply sit back in his shell and wait...but appliance manufacturers cannot be as patient as the oyster, they operate in a highly competitive industry, welcome new techniques that make their products more appealing and salable. Now lead helps you introduce an attractive — a pearlescent — finish for your household appliance line!

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Let us send you further information on how lead can make your product a glowing success with pearlescent finish — the type of finish with buy-appeal that helps you sell a wide variety of products. Write to Lead Industries Association, 292 Madison Avenue, New York 17, N. Y.

2710

LOOK AHEAD WITH **LEAD**

welded; this previously refers to article on carbon steels. Although design aspects as to edge spacing, minimum spacing between welds, etc., have been given

previously, it is only necessary that these factors are of equal importance in the welding of the aluminum alloys. Due to the fact that each spot weld will

tend to slightly expand the metal, all welding should start from the center of the sheet and work toward each end; this will prevent the sheet from warping.

The selection of the proper electrode shape, and the maintenance of this shape, is essential; at least one electrode being of such design that a high concentration of current will be obtained in the weld joint. The choice of tip contour will be dependent upon the alloy joined, the finish desired, and the thickness of the material. Practically all spot welding is done with dome type tips that have been machined to a spherical shape. At times, a flat surfaced tip is required on one side of a weld. Maintenance of shaped electrodes should be accomplished by machining or by a contour tip-dressing tool; hand filing or hand dressing being not sufficiently accurate to obtain consistent strength in welds. When material of dissimilar thickness is welded, the tip radius recommended for the thinnest member is chosen. If difficulty is experienced in obtaining consistent welds under these conditions, a flat tip is used against the thinnest member.

Elkaloy A metal electrode material is often used for spot welding the aluminum alloys. Mallory 3 Metal, which is a bit harder, has been used successfully. It should be remembered that the electrode material should not possess less than 30 per cent of the conductivity of pure copper, and the Rockwell hardness should be greater than B65. Weld pick-up, and softening of the tip in operation, is controlled by adequate cooling; the tap water being circulated within  $\frac{3}{8}$  inches or closer to the tip face at a rate of at least 2 gallons per minute. It is not adequate, it may be necessary to refrigerate the cooling water. The temperature of the electrodes should not exceed 60° F. except momentarily at the instant of forming the weld. Outside temperature of the cylinder wall should never exceed 90° F., even momentarily.

Every welding operator should be able to recognize weld defects in aluminum alloys. Cracks in the weld surface, tip pick-up, and welds that do not hold are the most common defects. Although surface indentation can be expected due to shrinkage within the weld, the operator should be able to determine the difference between normal and excessive indentation.

A burned spot weld is characterized by a star shaped or radial crack appearing at the center of the spot. This may be due to dirty metal, too high an elec-

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**Table 2 — Recommended Machine Settings for Spot Welding Aluminum Alloys**

**A. AC Welders**

Thickness, Inches	Weld Time, Cycles	Tip Shape		Welding Current, Amperes				Electrode Force	
		Major Diam. Min.	Radius of Face	1100-0 to 1100-H18	3003-H14 to 3003-H18	5052 6053-T4 6053-T6	Alclad 2024-T4	Minimum Lbs.	Maximum Lbs.
0.016	4	$\frac{1}{2}$ "	2"	15,000	14,000	13,500	14,500	200	350
0.020	6	$\frac{1}{2}$ "	2"	16,000	15,000	15,000	16,000	250	400
0.025	6	$\frac{3}{8}$ "	2"	17,500	16,000	16,000	17,500	300	450
0.032	8	$\frac{3}{8}$ "	2"	19,000	18,000	18,000	19,000	350	500
0.040	8	$\frac{3}{8}$ "	2"	21,000	19,500	19,500	21,000	425	600
0.051	10	$\frac{3}{8}$ "	2"	23,000	22,000	22,000	23,000	525	700
0.064	10	$\frac{3}{8}$ "	2"	26,000	24,500	24,500	26,000	600	800
0.081	12	$\frac{3}{8}$ "	2"	29,000	27,000	27,500	29,000	700	900
0.102	12	$\frac{3}{8}$ "	2"	32,500	30,000	31,000	32,000	800	1,050
0.128	15	$\frac{3}{8}$ "	2"	36,000	33,000	34,000	35,000	900	1,200

**B. Electrostatic Condenser-Discharge Stored Energy Welders**

Alloy	Electrode Force, Lbs.		Forge Force Timing* Millisec.	Condenser Voltage Range	Welding Current			Weld Shear Strength Range/lb
	Weld	Forge			Range (peak) Kiloamps	Time to Peak Millisec.	Avg. Rate of Rise ***	
Bare 2024-T4	1,200	2,400	35.2	1,800/2,200	31.0/37.8	11.4	3,020	430/680
Alclad 2024-T4	800	2,000	38.0	1,700/2,450	29.4/42.6	11.3	3,190	430/870
Alclad 2024-T81	800	2,000	39.5	1,750/2,200	30.1/38.2	11.4	3,000	430/630
Bare 7075-T6	1,200	2,400	35.0	1,650/2,100	28.4/32.2	11.6	2,780	430/675
Alclad 7075-T6	800	2,000	33.4	1,700/2,200	29.6/38.7	11.9	2,870	430/730
2014-T6	800	2,000	33.4	1,600/1,950	27.6/33.7	11.9	2,580	430/635
3003-H14	1,000	2,000**	38.0**	2,100/2,700	36.8/48.0	11.3	3,750	365/440
2014-T6 (0.035")	1,200	2,400**	35.0**	1,800/2,100	31.0/36.2	11.6	2,900	365/490
2014-T6 (0.048")	1,200	2,400**	35.0**	1,850/2,150	32.2/37.5	11.9	2,930	430/595
5052-H34	1,200	2,400**	34.0**	2,100/2,350	36.6/41.2	11.3	3,340	430/605
6061-T6	1,200	2,400**	34.0**	2,200/2,550	38.0/44.9	11.3	3,670	430/655

CONDITIONS — Electrode Contour - 4" Radius Face; Transformer Turn Ratio - 300:1; Condenser Capacity - 720 mfd; Material Thickness - 0.040" unless otherwise specified.

NOTE — \*Time from initial flow of current to start of forging; \*\*Forging not necessary to avoid cracks; \*\*\*amperes/millisec.

**C. Magnetic Stored Energy Welders**

Alclad 2024-T4 Thickness Combina- tion	Welding Force, lbs. (Constant System)		Welding Force, lbs. (Variable System)		Forging Force, lbs. (Variable System)	Weld Time To Reach ½ Max. Current, Sec.	Welding Current Peak (Constant System) Amperes	Welding Current Peak (Variable System) Amperes	Electrode Major Dia. Minimum, Inches	Electrode Face Geometry		Weld Diameter, Inches	Minimum Spot Spacing, Inches	Minimum Edge Distance, Inches	Shear Strength, lbs. per Spot
	Welding Force, lbs. (Constant System)	Welding Force, lbs. (Variable System)	Flat Face, Inches 15° Rake Angle	Radius Face, Inches											
0.016/0.016	144	80	240	.016	6,310	4,800	.200	.800	0.076	0.064	0.250	0.125	80		
0.020/0.020	225	125	375	.020	8,830	6,710	.250	1.000	0.094	0.080	0.312	0.156	125		
0.025/0.025	352	195	586	.025	12,360	9,400	.3125	1.250	0.118	0.100	0.390	0.195	195		
0.032/0.032	576	320	959	.032	17,900	13,600	.400	1.600	0.150	0.128	0.500	0.250	320		
0.040/0.040	900	500	1,500	.040	25,000	19,000	.500	2.000	0.190	0.160	0.625	0.312	500		
0.051/0.051	1,463	813	2,440	.051	36,000	27,350	.6375	2.550	0.240	0.204	0.796	0.398	813		
0.064/0.064	2,305	1,280	3,835	.064	50,600	38,400	.800	3.200	0.300	0.256	1.000	0.500	1,280		
0.072/0.072	2,915	1,620	4,860	.072	60,400	45,900	.900	3.600	0.350	0.288	1.125	0.562	1,620		
0.081/0.081	3,685	2,050	6,150	.081	72,100	54,750	1.012	4.050	0.380	0.324	1.265	0.640	2,050		
0.091/0.091	4,655	2,585	7,760	.091	85,800	65,250	1.138	4.550	0.430	0.364	1.425	0.710	2,585		
0.102/0.102	5,850	3,145	9,750	.102	101,800	77,400	1.275	5.100	0.480	0.408	1.593	0.796	3,145		
0.114/0.114	7,310	4,060	12,180	.114	120,200	91,500	1.425	5.700	0.540	0.456	1.781	0.812	4,060		
0.125/0.125	8,790	4,890	14,650	.125	138,000	105,000	1.562	6.250	0.590	0.500	1.953	0.975	4,890		
0.156/0.156	13,680	7,610	22,800	.156	192,600	144,000	1.950	7.800	0.730	0.624	2.435	1.218	7,610		
0.187/0.187	19,660	10,920	32,800	.187	252,500	192,000	2.335	9.350	0.880	0.748	2.920	1.460	10,920		

NOTE — Above data is designed to produce optimum spot welds whose diameters are four times the sheet thickness. The material is Alclad 2024-T4.



**in spite of surveys  
showing general satisfaction  
with appliance service,  
two dissenters say  
all is not well**



In the *Finish Line* editorial in the September issue of MPM, reference was made to current survey information which pointed to the general satisfaction among appliance users with present conditions of service at the consumer level. In the September issue, Marian Ingersoll discussed "The Problem of Home Appliance Service," in the Champaign-Urbana, Ill., area. Her survey revealed that, in spite of some extreme cases of dissatisfaction with appliance service, 67 percent of those surveyed had confidence in their serviceman.

Without questioning the results of such surveys, the September editorial pointed out that, for the individual consumer who has service difficulties, the law of averages means very little. As typical examples we are quoting letters from two appliance users.

The first, from Rochester, N. Y., is a copy of a letter which was sent to the service manager of a major appliance firm. The second letter, from Hamden, Conn., was addressed to MPM.

The names of manufacturers have been deleted. We are endeavoring to air industry problems and not point a finger at individual producers. The letters are published without investigation, so obviously we are not in a position to judge the merits of the cases.

## Readers write on service

### IT STILL LEAKS

Mr. \_\_\_\_\_  
Manager, Service Dept.  
Gentlemen:

I have a \_\_\_\_\_ refrigerator-freezer, Model \_\_\_\_\_, which has been unsatisfactory ever since we bought it from your Rochester \_\_\_\_\_ sales office. The refrigerator section does not work properly. It alternates between freezing all its contents, and not cooling at all. Frequently the ice melts off the cooling panels and fills, then overflows, the depression at the bottom of the compartment.

Tubing inside the refrigerator walls apparently grows ice, then thaws; the water runs down inside the walls. The outer case and door frames are now rusting. The water drips on the floor and spreads across the kitchen. Now the linoleum is stained black. Eventually the floor may rot out and dispose of the whole problem into the basement. I prefer to avoid this solution.

During the past several years your service people have made perhaps five or six visits to view this machine, and have had it back to their shop once for a few weeks. They have also sent out an independent serviceman several times. The gas has been replaced four or five times, and various other repairs done. Still it leaks.

The servicemen tell my wife that we are lucky with this box — other people have equal trouble with the freezer, whereas ours has been mostly refrigerator. The freezer has only failed once. Do you consider this performance good for a \_\_\_\_\_ product?

We have been trying since last May to get your service people to have one more go at stopping the water drip. During May and June my wife called. During my vacation

I called on July 5, 7, 11, 12, 13 and 19, each time obtaining a promise of immediate repairs.

We intend to rebuild our house, so on July 11 and 13 I asked your Mr. \_\_\_\_\_ to send out advertising on built-in \_\_\_\_\_ appliances. We wanted to at least look at your advertising before buying someone else's. We also wanted to know if you would accept the present lemon in trade on a new one that might work. Our confidence in your products may be shared by your staff, as we have not received any advertising.

Please advise what can be done with this refrigerator. My conscience boggles at advertising and selling it to another sucker.

Very truly yours,  
(Name on request)

Copy to: Manager, Rochester \_\_\_\_\_ Office  
President, \_\_\_\_\_ (parent company)  
President, \_\_\_\_\_ (Division)  
Sales Manager, \_\_\_\_\_ Division  
Better Business Bureau, Rochester, N. Y.  
Consumers Union  
Federal Trade Commission  
Editor, METAL PRODUCTS MANUFACTURING  
25 extra copies

### BRAKE MECHANISM LEFT OUT

Editor  
Metal Products Manufacturing  
York St. at Park Ave.  
Elmhurst, Illinois  
Dear Sir:

If you don't mind I would like to add my "two cents" to



your article, "The Problem of Home Appliance Service."

In 1955 we purchased a \_\_\_\_\_ washer and a [same brand] refrigerator (expected life for washer seven years, for refrigerator, 12 years). The washer failed within 60 days of the purchase date. Service call after service call produced servicemen but no repair.

We then moved and tried to contact a \_\_\_\_\_ dealer in the new location. The standard answer was, "We didn't sell it. We can't service it." In exasperation we wrote to the president of the company and explained our predicament. In reply we received a carbon copy of his letter to the local distributor stating that he (the distributor) was authorized to look at the machine.

The serviceman finally arrived and told us that the brake mechanism had been left out of the washer, and that he would have to order a new one. Sixty days later a phone call finally located the serviceman. He said he had the part but was too busy to come out and repair the machine (at this time the machine was one year old and was operable for two months out of that time). I threatened him with, "if he didn't come out, I'd come down and get him." To my surprise he showed up and repaired the brake mechanism.

Happy days — the machine worked for another 30 days and the timer went. Needless to say, the machine was out of guarantee so I replaced the timer. Thirty days later and again a new timer was installed. We went out and bought a new [another brand] washing machine.

[The first manufacturer] couldn't give us a washer on a silver platter. Full usable life of this \_\_\_\_\_ product — 120 days; aggravation — 14 months; blacklisted a lifetime.

The refrigerator was supposed to be frost-free. There is a self-draining unit at the bottom of this refrigerator that is supposed to take care of the excess water. This plugs up easily and water collects and when the door is opened the "box" acts like Grand Coulee Dam. With all this condensation collection, the supposed enamel "interior" is starting to rust.

The freezing compartment is so loaded with ice that it almost requires a stick of dynamite to open the door. This time, no service again. We finally packed this unit in and felt, as per above, about \_\_\_\_\_ products.

Another major product which we are disgusted about is the \_\_\_\_\_ dryer (self-condensing, non-vented). This unit has leaked since we bought it. All the servicemen that have come to look at the unit have said that all we had to do was to clean out the unit (we have vacuumed out the entire unit, and have scraped every bit of wet lint out of the entire unit, and still it leaks).

Seven months ago we wrote to the factory to have a man come down and look at the unit. He was injured, we subsequently found out, and our service call was with him at the time. I felt sorry for him, but where was his replacement? Seven months have gone by and still no serviceman. Does \_\_\_\_\_ have one man to cover the East, and if he is tied up, is the rest of the East still in their own exasperation?

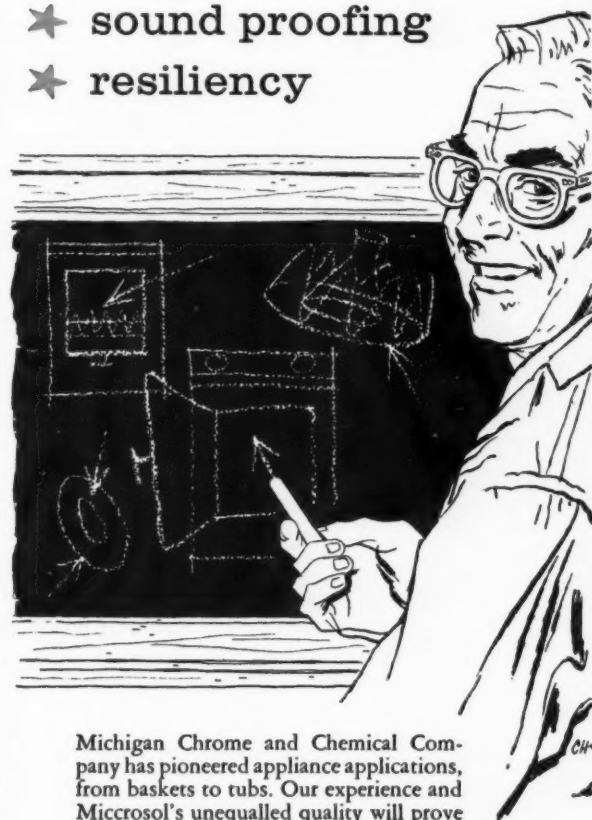
In conclusion, I disagree with the statement that it isn't the usual case to have bad service. To me this is a normal occurrence. God bless our appliance servicemen and their supervisors!

Please use my name. You have my permission.  
Very truly yours,  
W. E. Levine

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for products when  
you need . . .

- ★ corrosion resistance
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(Left) — After trimming, the radiant panels are notched on the top and sides in two operations, and holes are pierced in a third, shown in this photo.



(Right) — Surrounding the radiant chamber are a number of horizontal reflectors. These are retained by reflector support strips, shown being blanked.

## How a stamping plant went OEM

by *Ralph Stinson* • VICE PRESIDENT,  
BETTCHE MFG. CORP.

**M**OST CUSTOM STAMPING FIRMS are at the mercy of seasonal fluctuations. These wide variations in business activity create innumerable problems, ranging from retaining skilled employees to uncertainties in long-range capital-equipment purchasing plans. For instance, those stampers who do a great deal of automotive work are at the mercy of the well-known and extremely wide ups-and-downs of this business. To make matters worse, the independent stampers and captive stamping departments concerned with automotive work are tooling up at the same time, making tool procurement difficult.

Diversification of the markets to whom the stamper sells is the commonest attempted solution. Although automotive sales may follow the same trends

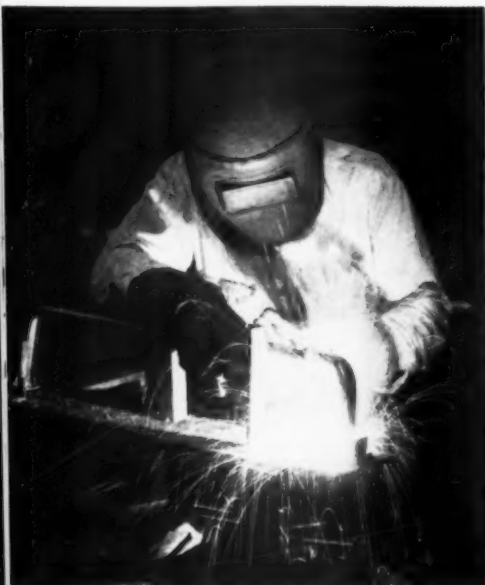
associated with some other expensive consumer goods, such as heavy appliances, seasonal fluctuations can be ironed out considerably as the stamper begins to work with divergent industries, such as automotive, appliance, truck, aviation, electrical and others. This market-mix can be planned so that even highly seasonal products become attractive inasmuch as they offset each other and lead to a fairly constant amount of monthly business. For instance, Bettcher Mfg. Corp., Cleveland, produces stampings for the air conditioning, refrigeration, heating, automotive, tractor, aircraft, railroad, vending machine, and many other industries.

Bettcher has also diversified in another way. Their engineering staff has a great deal of design experience from re-

design of castings, heavy weldments, etc. to assemblies of lighter stampings for equivalent or greater strength. In this case, they not only make and sell stampings; they design and produce the final subassembly.

A somewhat different approach carries them into complete assembly of complex products. They not only produce stampings and arc or spot welded assemblies, as do many stampers; but they also produce complete assemblies of complex final products. For a suitable product that is made largely of stampings, Bettcher will produce the component parts, assemble and test the final product, and package it ready for shipment. They have gathered much experience in furnishing this total package for such divergent products as electrical apparatus, coin-operated appliances, gas heaters, and domestic furnaces.

Performing so many operations on one product sounds as though it would intensify, rather than alleviate, seasonal fluctuations. However, Bettcher finds it easier to schedule production, purchase or repair tooling, purchase



(Left) — The horizontal reflectors are protected by vertical guards. In addition, the finished heater has no base on which it can be supported for packaging or shipping. This difficulty is overcome by bolting wooden "legs" to the reflector guards. Here, flanges are being arc welded to both the ends of one of the guards.

The controls at bottom of the heater are protected by a two-piece control cover. Each of these is made in a channel shape, with an end spot welded in place. Finished assembly is painted with synthetic baking enamel at 250° F.

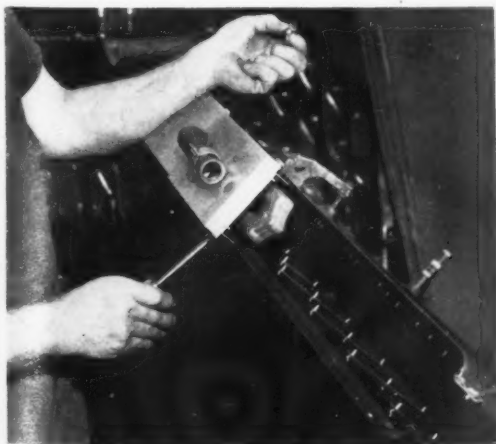




After painting, the control covers receive a silk screened emblem, and lighting and operating instructions installed.

material, increase or decrease inventory, and schedule the work force when they control all production operations than when they make only a simple stamping which in turn is shipped to the customer for assembly. The advantages to the customer are equally worthwhile. Although he has the same investment in tooling, he has no need for the capital equipment, buildings, work force, or overhead associated with manufacturing, and can concentrate on selling.

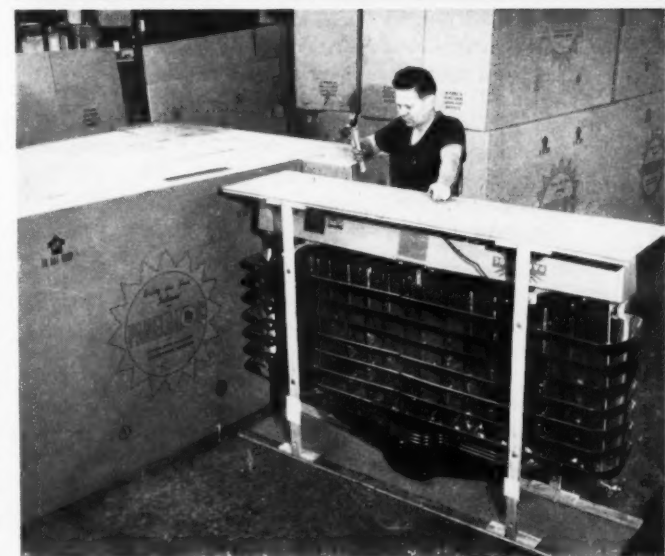
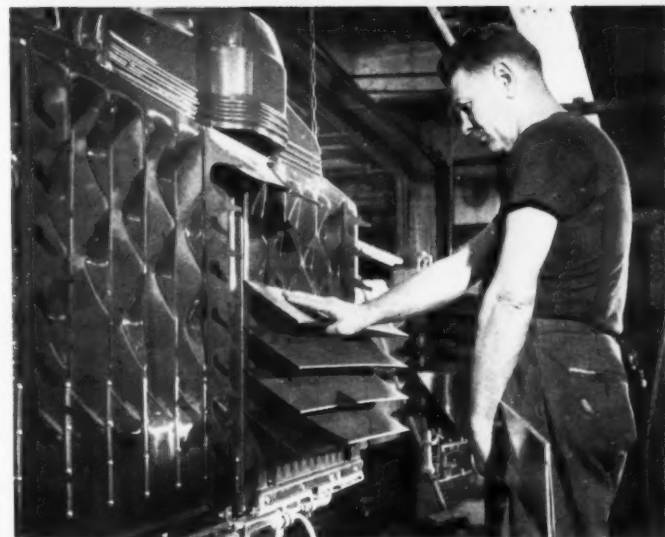
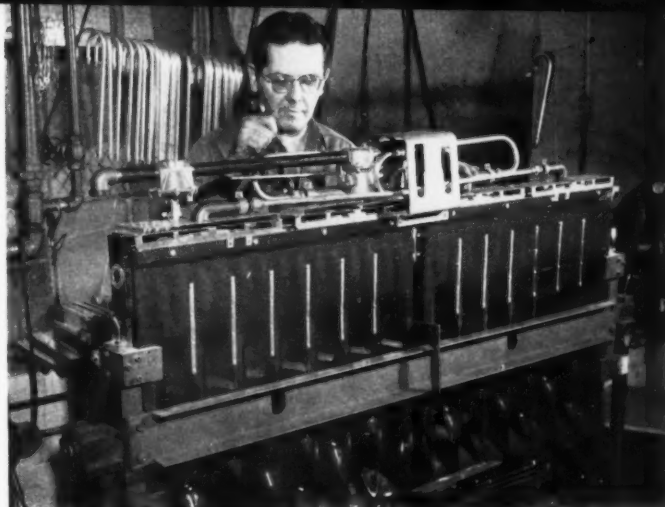
The Panelbloc, an infra-red gas radiant heater, is built completely by Bettcher. Bettcher has manufactured and shipped nearly 10,000 of these heaters in the past four years. Recently, Bettcher purchased the Panelbloc, establishing the new Panelbloc Div. of Bettcher Mfg. Corp. Although the purchase of a customer's product line would normally cause problems due to lack of experience in marketing the final product, Bettcher has skirted these thin-ice areas by acquiring the services of both the heads of the original Panelbloc sales department, and the entire sales organization which has done so well for Panelbloc in the past. MPM



(Right) — Final operations on the control piping show the heater nearing completion, still in an inverted position in the assembly fixture. The pressure regulator is at the operator's right shoulder. An automatic diaphragm valve is in the center of the heater. This is operated by the thermostat. Since the heater has no outside electrical connection, the small amount of current required to operate the thermostat is provided by a millivolt pilot generator powered by a thermopile mounted in the pilot flame. In case of pilot failure, the gas is sealed off automatically.

After the controls are assembled, the heater is mounted on an overhead conveyor assembly line where the final operations are performed. One of these consists of snapping reflectors into place.

While the heater is hanging on the overhead conveyor, the reflector guards are added and the four vertical wood strips are bolted to the guard. The unit is then completely flame tested, all connections checked for leaks, and all controls examined for proper operation. After removal from the conveyor, the top of the carton is nailed to the ends of the wood strips and the heater is turned over. The bottom of the carton is being nailed on in this photo. The carton is then dropped on and stapled to the top and bottom. Holes may be seen near one end of the vertical strips.



(Left) — At assembly, the radiant chamber is clamped in a trunnion fixture which provides convenient access to the bottom. The individual cast iron, raised-port burners are assembled and radiation shields are added to prevent radiant heat from affecting the controls. Heat regulation is provided by an ambient air thermostat. As heat warms the floor of the building, the floor in turn causes updrafts of warm air. It is this rising warm air current which actuates the ambient thermostat.



# One coat porcelain enameling reaches production status at Westinghouse

the present status of DOFP  
(direct-on finish process)  
with "zero carbon" steel  
and a new  
metal preparation system  
at Columbus plant

## GOOD PROCESS CONTROL IMPORTANT

**W**ESTINGHOUSE WAS ONE OF THE first corporations to do extensive plant work for the development of a system for one-coat application of porcelain enamel direct to steel. A great deal of this early work was done in the Mansfield plant on range parts. This article follows extensive testing in the Columbus plant on refrigerator food compartments and crisper pans during the past year and a half.

The DOFP (direct-on finish process) to be described involves the new "zero-carbon" steels and a new ferric sulphate-sulphuric acid pickling process developed in the laboratories of a frit manufacturer.

Much work with direct-on finishing had been done earlier, using grit blasting, but the arrival of the new zero-carbon steel revitalized the company's development work. This steel, combined with the new pickling process, has now brought the development up to production status.

### **Products and requirements**

The bulk of the development work has involved food compartments for refrigerators, since they were considered the most difficult interior parts. The food compartments are up to 48 inches long and include six seam welds and four mash welds.

Early in the development project, basic requirements were established for DOFP. They included metal preparation which could be duplicated on a continuous basis, adherence at least equal to a two-coat system, and appearance equal or better than a two-coat system.

Considering assembly problems: food compartments must maintain adherence at four front corners when flexed to a compressed angle of 82°, and both food

compartments and crisper pans must withstand screw assemblies without chipping.

Westinghouse records show that with DOFP: work processing time has been reduced; porcelain enameling cost has been reduced; and the food compartment has been improved by (a) elimination of corner brushing, (b) elimination of ground coat drain streaks, and (c) elimination of re-ops from reboil or blistering.

### **Pickling equipment**

For the ferric sulphate-sulphuric acid pickling process, two additional tanks are provided between the final cleaner rinse and the regular sulphuric acid stages. A steel tank is satisfactory for rinsing, but a heated tank (lined with stainless steel, acid-proof brick, or lead) is needed for the ferric sulphate solution. At Westinghouse, type 316 stainless steel was selected for the tank lining.

Where continuous immersion pickling is involved, type 316 stainless steel is suggested for submerged hanging fixtures.

A stainless steel dispensing tank is used, together with the required piping, for the air agitation and hydrogen peroxide regeneration system for the ferric sulphate solution.

Sulphuric acid is required to maintain the acidity of the ferric sulphate bath within the operating pH limit of  $1.3 \pm .1$ . Therefore, provision must be made for the continuous, controlled addition of concentrated sulphuric acid to the ferric sulphate bath by gravity feed.

Either reagent grade ferric sulphate salts (73 percent assay) or exsiccated U.S.P. ferrous sulphate salts (83 percent assay) — requiring subsequent

oxidation to the ferric state — can be used for charging the ferric sulphate tank. Westinghouse started with ferric sulphate salts, but converted to ferrous sulphate salts, as results were satisfactory with the latter, and the cost is about one-third. Once the pickling bath is properly set up there is very little additional cost, as it is a permanent bath

Ronald Hines, process control, points out sulphuric drop bottle used to control Ph in the ferric-sulphate etch tank.







Jack Swartz, general foreman of Division 4 (fabricating, enameling and subassembly for all porcelain enameled parts, plus wire rack fabrication and plating), shown with pressure vessel used to force the hydrogen peroxide into the bottom of the etch tank.

*Editorial Note: In the November issue of MPM, Jay Simons, manager of manufacturing, Westinghouse-Mansfield, said that metal preparation for the direct-on process for current work at Mansfield is being done at the Columbus plant, where complete facilities were installed for specialized metal processing. MPM editors followed this report with a trip to Columbus to obtain plant experience details for the accompanying article.*

within the operating limits of  $1.0 \pm 1.0$  and  $4.50 \pm 1.5$  percent, respectively, for direct-on work.

#### Bath control

Chemical titrations are employed to check both the ferrous and ferric sulphate content of the bath. The controlling of the ferric sulphate concentration involves the oxidation of the ferrous sulphate to the ferric state by means of the addition of hydrogen peroxide (35 percent assay) and 66° Bé sulphuric acid on the basis of the chemical reaction  $2\text{FeSO}_4 + \text{H}_2\text{O}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{Fe}_2(\text{SO}_4)_3 + 2\text{H}_2\text{O}$ .

In processing ware through the ferric sulphate bath for direct-on, the ferrous sulphate concentration is permitted to increase to approximately 1.5 percent before any adjustment is made in the ferric sulphate concentration. On the basis of the actual percentages of ferrous and ferric sulphate found present, calculations are made to determine the amount of tank dilution and the amount of hydrogen peroxide addition that is required to oxidize all of the ferrous sulphate present in the solution retained, in order to adjust the ferric sulphate concentration to operating strength.

To prevent the possible precipitation of basic ferric sulphate, on the basis of the reaction  $\text{Fe}_2(\text{SO}_4)_3 + \text{H}_2\text{O} \rightarrow \text{Fe}_2(\text{SO}_4)_2 + \text{H}_2\text{SO}_4$ , the addition of sulphuric acid is necessary to maintain a

bath operating pH of  $1.3 \pm .1$ . This can be accomplished by adding 66° Bé sulphuric acid continuously to the ferric sulphate bath at a rate which will meet the recommended pH limits. By maintaining an operating solution pH of  $1.3 \pm .1$ , sufficient acid will always be available for the complete oxidation of the ferrous sulphate to the ferric state.

While the ferric sulphate is an effective etchant, sulphuric acid cannot be eliminated from the pickling process because it is required for the complete removal of rust and weld scale.

The rate of attack of ferric sulfate is four to six times that of sulphuric acid; thus a roughening of the metal is secured by selective etching. This etching, together with adequate nickel deposition, produces a metal surface suitable for one-coat direct-on.

#### Ready for production

Following one and a half years of development, including large production trials, Westinghouse has determined that the process can be successfully used on a production basis. Largest runs have been on refrigerator food compartments and crisper pans. Sample runs have also been made on range parts for the Mansfield plant.

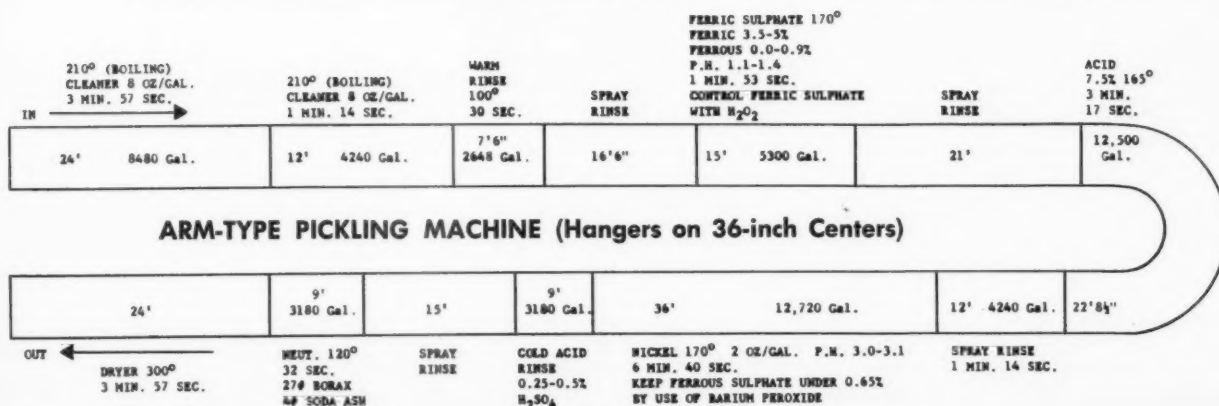
Sufficient work has now been run over the extended trial period to assure the company the system will run consistently to duplicate results from day to day.

to Page 82 →

requiring only the addition of hydrogen peroxide to provide for intermittent dilution and oxidation.

Westinghouse stresses the importance of a good process control system if the ferric sulphate bath is to be used. It is pointed out that ferric sulphate etches ferrous metal without the evolution of hydrogen in accordance with the chemical reaction  $\text{Fe} + \text{Fe}_2(\text{SO}_4)_3 \rightarrow 3\text{FeSO}_4$ , which forms sulphate as the only contaminant. Since the degree or type etch obtainable with ferric sulphate is a function of concentration, the procurement of the best possible pickling results necessitates the controlling of the ferrous and ferric content of the etchant bath

### FERRIC SULPHATE — SULPHURIC ACID PICKLING PROCESS AT WESTINGHOUSE





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## Fabricating

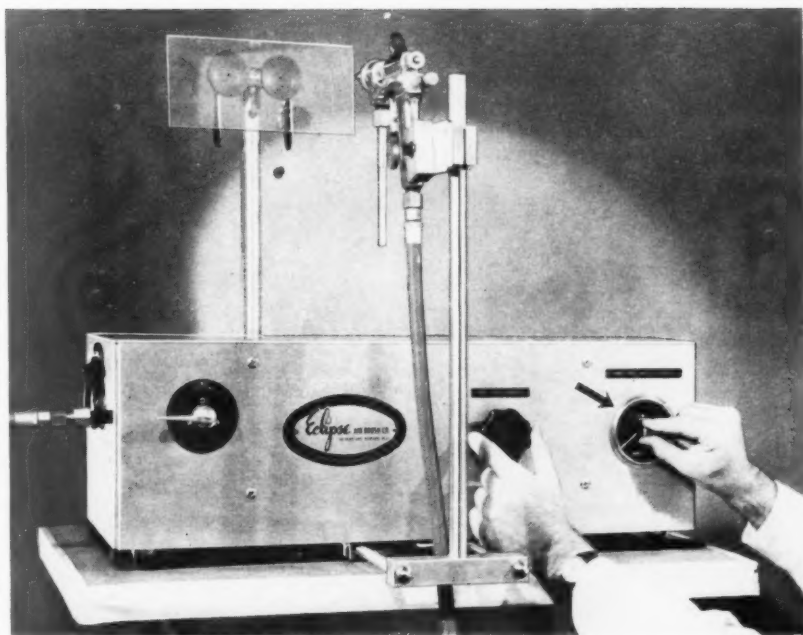
→ from Page 37

trode temperature, insufficient electrode pressure, or excessive welding current. This type of defect produces a focal point for corrosion and, in time, will weaken the weld. Tip pick-up is a result of alloying of the material welded with the copper within the electrode; this being controlled by proper cooling, using tips of sufficient size, and carefully preparing the surface by proper cleaning procedures. Fast timing in applying welding current will promote longer tip life, which will be reflected in an increase of more spots between cleaning. In addition, fast timing will reduce heat input, and will realize less surface indentation. Burned holes are also a source of difficulty which may be caused by: (a) insufficient electrode pressure to squeeze the metal effectively; (b) the presence of foreign material such as paper, steel wool, etc., between the pieces being welded; (c) emery dust or emery cloth adhering to one of the electrodes; and (d) attempting to weld at a point where there is a screw, a projection, or a drilled hole.

The aluminum base alloys are projection-welded only to a limited extent. Since normal projection designs on flat aluminum sheet products are not satisfactory due to the lack of strength at the welding heat, this method has been confined to extrusion, or the joining of studs, bolts, etc., to heavy sections.

Seam welding, which can be performed either with AC or condenser energy-type equipment, requires electronic timing so necessary for precision control in obtaining the highest quality weld. The roller electrodes are from  $\frac{3}{8}$  to  $\frac{5}{8}$  inches in thickness; either one or both being dressed to a Vee ranging from 158- to 166-degree included angle, or to a 2- to 3-inch radius. Electrodes are also water cooled. Electrode pick-up may be especially troublesome; excessive welding speed frequently causes aluminum to stick to the electrode. Such material should be removed from the roller electrodes by dressing with a suitable grade of emery cloth, or it may be continuously dressed by holding a medium-fine grade commutator stone against the wheel with 5- to 10 pounds pressure. More frequent dressing is required when the roller electrodes revolve continuously, as compared to an intermittent motion when the electrodes stop for an instant while each spot is made.

*Credit is given Kaiser Aluminum and Reynolds Metals for their contributions in the preparation of this series of articles.*



Air motored test panel sprayer. Dial at left is operation selector. Center knob is the speed control, and tachometer dial can be seen at right (arrow).

## Assuring a perfect match in today's production painting

BY *Warren Beach* • PRESIDENT, ECLIPSE  
AIR BRUSH COMPANY

THE PROBLEM OF COLOR MATCHING paint was heightened when the mass production industries turned to delicate pastels, tricky polychromatic finishes and the multitude of shades known as appliance whites. Because the assembled pieces have to blend as if painted in one operation the standards of color matching become so exacting that new methods of assuring perfectly matched colors had to be found.

Each product part painted in a different section of the plant, or even in plants at different locations, must match when assembled.

To insure perfect matching, a system of color tolerances is employed based on the National Bureau of Standards NBS color unit. This unit is defined as three to four times the minimum color difference perceptible to the trained observer under the best conditions of observation.

The old method of color matching and color testing by hand spraying was inadequate for the new colors and finishes. Human variations in speed of traverse, distance from and angle to the test panel produced dissimilar results even with the same batch of paint.

This dilemma called for the development of a test panel sprayer which would be practical and still eliminate all human error in the application of finishes for matching and testing.

The first successful test panel sprayer is being marketed by Eclipse. The first of these machines was purchased by E. I. DuPont de Nemours and Co. They now have over forty units in operation at seven plants throughout the United States. Other machines have been purchased by paint manufacturers and end users including several of the large automotive companies.

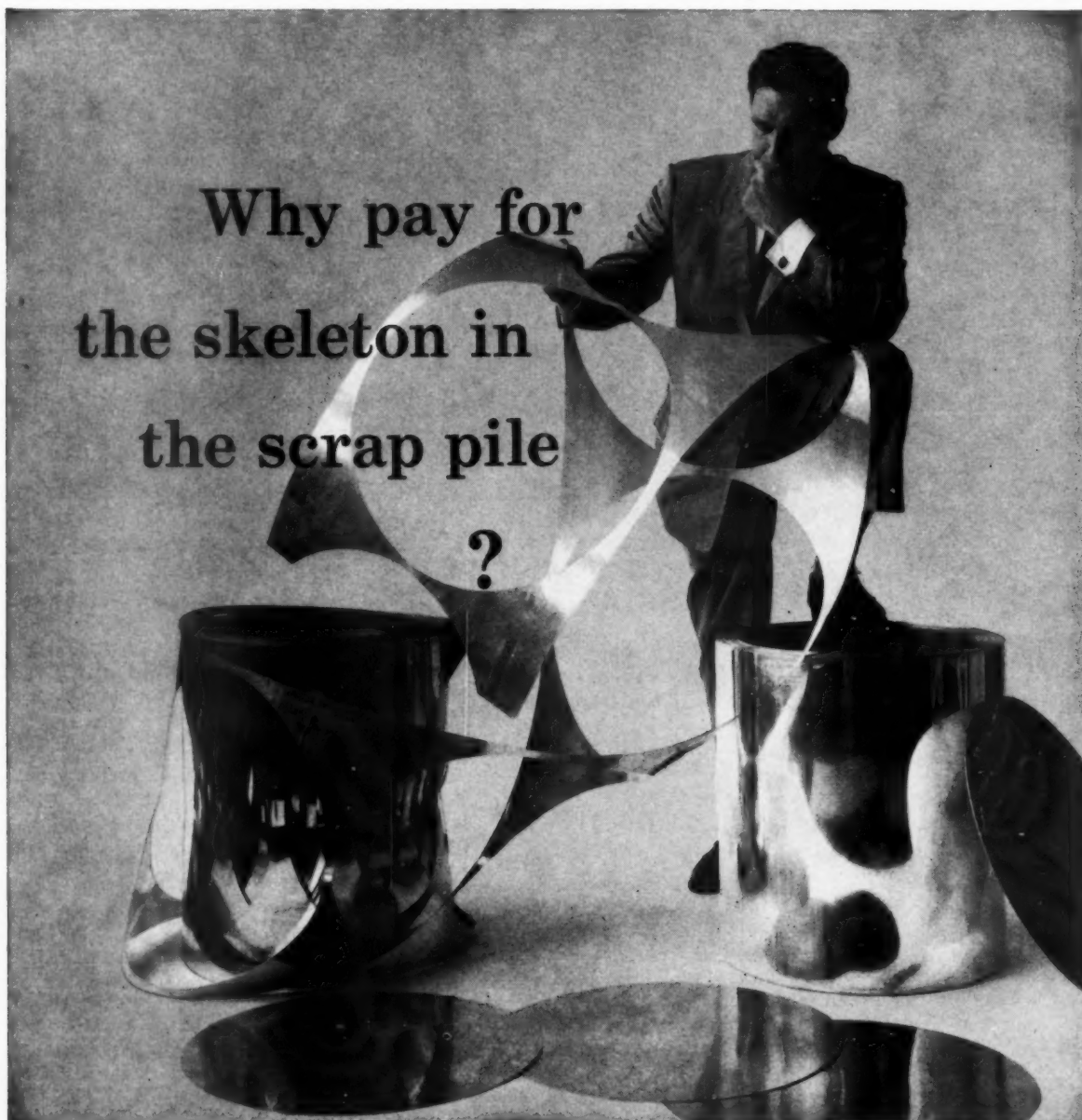
The test panel unit runs by compressed air, can easily be carried by one operator, and runs at variable speeds which can be read directly in inches/minute from a dial at the front.

Often a matching problem develops when one sprayed swath is overlapped with another. So an adjustable lapping attachment has been developed which permits lapping two swaths on one panel.

Since paint is not produced in a continuous run, each order must be tested and matched to the customer-accepted standard for color and other character-

to Page 49 →





Why pay for  
the skeleton in  
the scrap pile

?

**WHEN** you stamp your own aluminum circles or any irregular blanks, up to 25% of coil weight ends up as scrap.

You can eliminate this waste—plus labor of shearing and blanking—by buying circles or blanks direct from Fairmont.

Fairmont is *the* source for circles. As a prime supplier of aluminum blanks to *every* utensil maker, Fairmont's 30-year stockpile of dies is unduplicated anywhere. Find out how easily we can fill your requirements from our stock of dies.

Or by blanking from your dies in our plant, we can effect labor, material savings for you.

Other Fairmont benefits: the consistent quality that is a Fairmont tradition . . . individual flash annealing for finer grain structure . . . 100% inspection of every blank.

**FIND OUT ABOUT FAIRMONT'S  
CUSTOM BLANKING SERVICE NOW**

A Fairmont engineer will be glad to give you details. Call your local Fairmont office. Or write Vice President, Sales, Dept. 22-L, Fairmont Aluminum Co., Fairmont, West Va.

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**CERRO**  
DE PASCO CORPORATION



## Editor's mail

→ from Page 8

### An aid to purchasing

Gentlemen: The writer appreciates receiving your METAL PRODUCTS MANUFACTURING publication. It is quite interesting and has furnished us with several ideas which have been adapted to our production department. It has also furnished the purchasing department with data that has been useful in the procurement of items for our products. Kindly continue your forwarding this publication.

We would, however, suggest that you eliminate from your mailing list the Raetone Commercial Refrigeration Corp., Plymouth Meeting, Pa. This company is a sales subsidiary of the Victory Metal Mfg. Corp. Thus, at the present time, we are receiving duplicate copies.

F. J. Maurer, Director of Purchases  
Victory Metal Mfg. Corp.  
Plymouth Meeting, Pa.

### The Space Age 18

Gentlemen: Please advise, return wire, availability, cost and possible delivery date, via air mail, of 150 reprints, January article on Hotpoint Space Age 18 in METAL PRODUCTS MANUFACTURING.

R. T. Hilb, Advertising Manager  
Hotpoint  
1 Life St., Boston, Mass.

### Informative and interesting

Gentlemen: I think you have a very fine publication. The articles and pictures covering the metal fabricating industry have been very informative and interesting.

Charles R. Thorpe, Jr.  
York Div., Borg-Warner Corp.  
York, Pa.

### Wrong press

On page 64 of the November issue a story appeared titled, "Chicago Press Makers Display Latest Equipment." At the bottom of the page was a photo of a Danly press identified as a 400-ton Autofeed model. This was incorrect. The press shown (see accompanying photo) was a



400-ton straight-side model. This press was on display at the Danly factory during the Tool, Machinery & Production Engineering shows in Chicago.

A photo of the Danly 400-ton Autofeed press appears on page 80 of this issue.

## KEYSTONE CAMERA

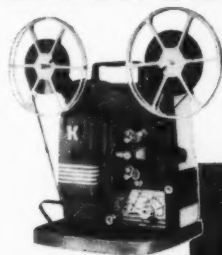
Relies on

# RANSBURG

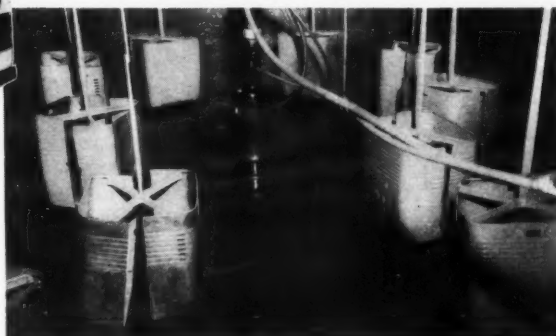
## No. 2 Process

### Electrostatic Spray Painting

to get the high quality  
wrinkle finish on  
cameras and projectors



Projector covers rotate as the conveyor makes a loop around the ceiling-mounted Ransburg No. 2 Process reciprocating disk. Electro-Spray is providing large paint savings on this wrinkle application, and permits Keystone to meet increased production requirements.



Keystone Camera Company, Inc. adheres to a strict quality control program—from start to finish—in the production of their widely-distributed, high quality home movie products. That's one reason for using the Ransburg No. 2 Process to apply a uniform wrinkle finish on their cameras and projectors.

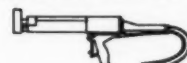
### IMPROVED QUALITY AND LARGE PAINT SAVINGS TOO

Together with the improved quality and greater uniformity in their finish, Keystone reports large paint savings over former air hand spray. Rejects which used to run 7%, or more, are

reduced to less than 1%. Too, Ransburg No. 2 Process has enabled their finishing department—often a bottleneck in production—to meet steadily increasing production requirements without resorting to expensive overtime. Now, with the automatic No. 2 Process, they can turn out more projector covers in an hour than one operator formerly painted in a day. And, assembled cameras are painted five times faster with Electro-Spray. As a result of these desirable advantages—coupled with even higher production schedules—another Ransburg No. 2 Process unit was authorized for a second, identical production line at Keystone.

### NO REASON WHY YOU CAN'T DO IT, TOO

Let us show you how Ransburg No. 2 Process can improve the quality of YOUR painted products, and at the same time, cut YOUR paint and labor costs. Send for our No. 2 Process brochure. Or, if your production doesn't justify automatic painting, let us tell you about the No. 2 Process Electrostatic Hand Gun which can be used in either conveyorized or non-conveyorized painting.



## RANSBURG Electro-Coating Corp.

Box 23122, Indianapolis 23, Indiana

## From foundry cores to flower pots, Hevi-Duty ovens produce clean, uniform results

It makes no difference "what's in the oven" — all products benefit from the cleanliness and uniformity of performance of Hevi-Duty units. Further, while this uniformity benefits your products, you benefit from Hevi-Duty versatility.

Hevi-Duty offers the largest and most complete line of ovens and other heat processing equipment in the industry. There is a size and type oven to fit your specific requirements, and adapt to your over-all operation.

Why not ask your Hevi-Duty systems engineer to study your operation and recommend the unit that

would be most efficient for you. He will be glad to do it without obligation. There is a Hevi-Duty office near you.

### HEVI-DUTY

Electric and Fuel-Fired  
Industrial Furnaces and Ovens



A Division of  
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Corporation

Hevi-Duty Electric Company, Milwaukee 1, Wis.



This Hevi-Duty Oven bakes cores for sand casting brass bushings and gears at Bucyrus-Erie Company, South Milwaukee, Wisconsin. The finished parts will be used in the world's largest power shovel. This oven more than matches the output of the unit it replaced, yet it requires only half the floor space. Further, its temperature uniformity and efficient combustion assure clean cores of excellent quality. **For complete information on this, write for Bulletin 259.**



Stainless Foundry and Engineering, Inc., Milwaukee, Wisconsin, uses this Hevi-Duty oven for drying molds and cores. It operates 24 hours a day, five days a week at 475° F. Its over-all temperature uniformity, excellent circulation of heated air has doubled capacity of the previous unit. Efficient combustion has also resulted in fuel savings, and contributed to the excellence of the finished castings. **For complete information on this, write for Bulletin 259.**

A unique system of ducts above and below each belt distributes hot air evenly among these three tiers of paper mache flower pots. This oven also dries packaging materials for a large Midwestern container corporation. Built in standard 20-ft increments, it can be expanded to meet any continuous evaporation process by simply adding new sections. **Please write for Bulletin 159.**



## Assuring a perfect match

→ from Page 45

istics. The "OK" to run the batch is then given. After the batch is completed a wet and/or dry (panel) sample may be sent to the customer for his acceptance before shipment. Throughout the process test panel sprayers are used.

Today the operator — whether a production color shader or quality control technician — can quickly fit a panel of any size (3 by 5 inches to 12 by 14 inches) or material against the venturi-operated suction cups. Then the speed is set as designated in the specifications (anywhere from 300 to 2500 inches a minute) and the distance from the gun to the panel (from 6 to 18 inches). After the gun is adjusted vertically (anywhere 6 inches above or below center line of the panel) the operator can produce a test panel to specification.

Once the specifications are followed, the end result is always the same. The coatings are of uniform thickness; the colors can be duplicated in test panels whether in South Bend, Detroit, Philadelphia, or San Francisco.

The test panel sprayer has made possible the development and classification of thousands of polychromatic colors that are employed in the finishes of vacuum cleaners, water coolers, air conditioning units, lamps, filing cabinets and automobiles. Automotive finishes include, for example, the slow-drying synthetic resin finishes and the fast-drying nitrocellulose lacquers. One large automotive plant now produces seventy-seven different colors on its cars — colors quickly and accurately reproduced by the test panel sprayer.

There are over a hundred shades of appliance white. These and the new pastel shades are more accurately matched. Doors and bodies of refrigerators, colored and white kitchen cabinets, ranges, home freezers and washing machines and dryers are usually sprayed at different times with different batches of material.

The panel sprayer is also suited to produce accurate duplication of film thicknesses for exposure, salt spray, chemical test, etc.

The panel sprayer is placed in, or in front of, a spray booth. For the air-operated unit only a hose from the main line air supply need be attached. The electric unit requires an explosion-proof electrical connection.

Any standard make hand spray gun may be used. The gun is locked to the bracket with a thumb screw. The distance between the gun and the panel may be varied but remains at the set readable distance until moved. In like manner, the gun height and angle to the panel may be changed when desired.

When the gun is directed as desired, a panel is placed on the carrier, the machine is turned on, and the panel begins to reciprocate at a constant speed in front of the gun. The operator depresses the trigger for one or more passes according to the requirements.

Electric units have 11 combinations of change gears for control of panel speed, and a magnet bracket to hold the panel. The air-operated unit is driven by compressed air, instead of an explosion-proof electric motor, and the speed of traverse is read directly from a tachometer calibrated for inches a minute. The panel is held by a pair of venturi-operated vacuum cups.

Although the machines are designed primarily to permit duplication in coating application, they also nearly parallel hand spray procedure, the results being practically identical, and generally simulate automatic operation exactly.



After spray coating of Fiberglas Flake is applied, it is rolled to achieve a smooth, uniform surface. According to the manufacturer, the coating can be utilized in fields where corrosion is a major problem, including chemical and oil storage tanks, jackets for industrial stack insulation, and the industrial ducting of chemical materials.

## Fiberglas Flake protective coating

**F**IBERGLAS FLAKE PROTECTIVE COATING, a spray coating providing a corrosion-resistant surface to metals and other materials, has been developed by Owens-Corning Fiberglas Corp. Concurrently, a spray gun unit especially designed for applying the new product has been developed by the DeVilbiss Co., Toledo, Ohio.

A current report states that accelerated weathering tests have shown virtually no deterioration of the coating and laboratory tests of the coating show the following: vapor transmission — less than .01 perms; shear strength — 800 psi; and dielectric strength — 500 volts per mil.

The coating, a homogeneous mixture of Fiberglas Flake, resin, fillers, accelerator and pigment (if desired), can be utilized in many fields where corrosion is a major problem, such as on chemical and oil storage tanks, jackets for industrial stack insulation, and industrial ducting of chemical materials.

Use of Fiberglas Flake with resin is said to reinforce the coating by holding shrinkage to a minimum and increasing impact resistance. In addition, crawling of the coating is reported to be eliminated because of the high shear force that exists between the layers of flake and resin as applied.

According to company engineers, the problem of pinholes is eliminated in the new product by the isolation of air bubbles or voids with many layers of flake glass. The flake reinforcement of the resin reduces cure shrinkage, which improves the adhesive properties of the coating, as well as eliminating surface haze.

Satisfactory performance of the material depends on proper preparation of the surface to be covered. The actual spraying of the surface is best accomplished at a distance of approximately two feet. The coating is then rolled with a paint roller to give the desired smoothness and to orient the flakes, eliminating the possibility of pinholing.

The coating will be available commercially to a limited number of applicators of corrosion resistant coatings and industrial users in pilot plant quantities. MPM





Out of this world ...

*MicroRold*

## MOON STEEL

Because stainless steel has helped to bring man's conquest of the heavens ever nearer, it has rightfully earned a new space-age name —MOON STEEL.

Since 1955, Washington Steel has been the exclusive supplier of light gage stainless steel sheet for the outer covering of the Atlas missile. The reason is simple: Washington Steel pioneered in the art of rolling stainless steel to uniform gages and has been able to meet the exacting specifications set up by space engineers for this momentous undertaking.

This is why MicroRold® stainless is truly out of this world!



**WASHINGTON STEEL CORPORATION**  
Washington, Pa.  
\*REG. U.S. PAT. & TM. OFF.



The refrigerator line includes this model which has a 17-pound seven-day meat keeper. By injecting cold air directly into the meat drawer, the temperature within is kept right around 30 degrees, adding to the life of all fresh meats. The freezer section at the top holds 110 pounds, and features an ice cube server that will store 160 cubes indefinitely. Frost never forms in either section.

## New 1961 products by Westinghouse

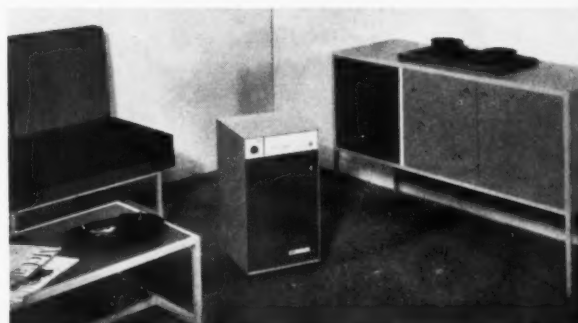


(Left) — A flip of a switch makes this upright home freezer defrost itself quickly. Air sweep shelves permit passage of the cold air directly through the shelves, speeding up the freezing process. Tilt down racks on the door make package removal easy. The bulk-storage basket at the bottom rolls out, and small racks on the left side of the door are removable.

(Right) — This Cosmopolitan wash 'n dry combination is a complete laundry in 32 inches of space. An automatic bleach dispenser injects the proper amount of diluted bleach into the wash at exactly the right time. Five different fully automatic wash and dry programs can be set from the single control. On the "automatic dry" setting, a sensing device turns the machine off when clothes are dry.



On this 40-inch, double oven range, the doors to both ovens lift off for easy cleaning. Controls are dial-type for "fine tuning" an infinite number of positions.



Feature of the Custom Supreme dehumidifier is the water overflow control which permits unit to be used in any room. Added feature is the humidistat, giving owner a "Dry," "Extra Dry" or "Continuous Run" condition.



# TEAMWORK

## FROM G.E.I.



### Helps **WEBCOR** Produce This New Tape Recorder

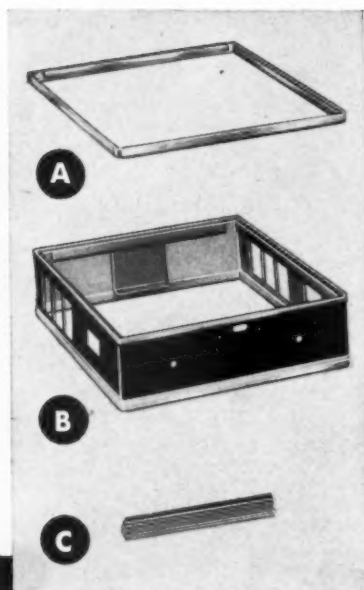
The 1961 line of Webcor sound reproduction equipment features this new Model 2101 Royalite tape recorder. Weighing only 19 lbs., its case contains three vital extruded aluminum parts produced by General Extrusions Inc. The top trim (A) is punched, formed and General satin anodized. The main frame (B) is drilled, punched, mitered, formed, General satin anodized and spray-painted black in G.E.I.'s modern plant. The handle (C) is drilled, polished, mitered and Generalbrite anodized.

This is another example of a leading manufacturer turning to General Extrusions Inc. for assistance and teamwork in getting a new product on the market. Not only were the engineers of G.E.I. able to meet the close tolerances required by Webcor, but G.E.I.'s production facilities also were capable of producing the job in large quantities in time for the Christmas selling season. If you have a new product on your drawing boards, why not let G.E.I. help pull the pins?

Write for our new catalog on stock dies and standard warehouse items.

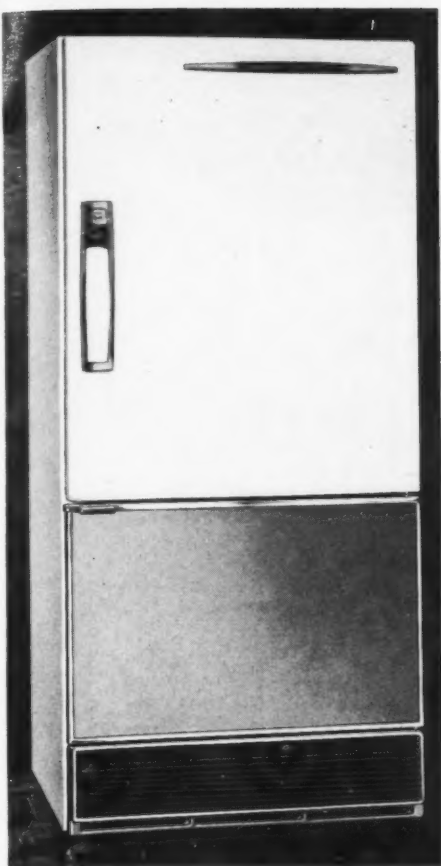
#### GENERAL EXTRUSIONS INC.

Dept. P, P. O. Box "J", 4040 Lake Park Rd., Youngstown 7, Ohio  
Sales Offices in St. Louis, Cleveland, Cincinnati, Pittsburgh  
and Chattanooga



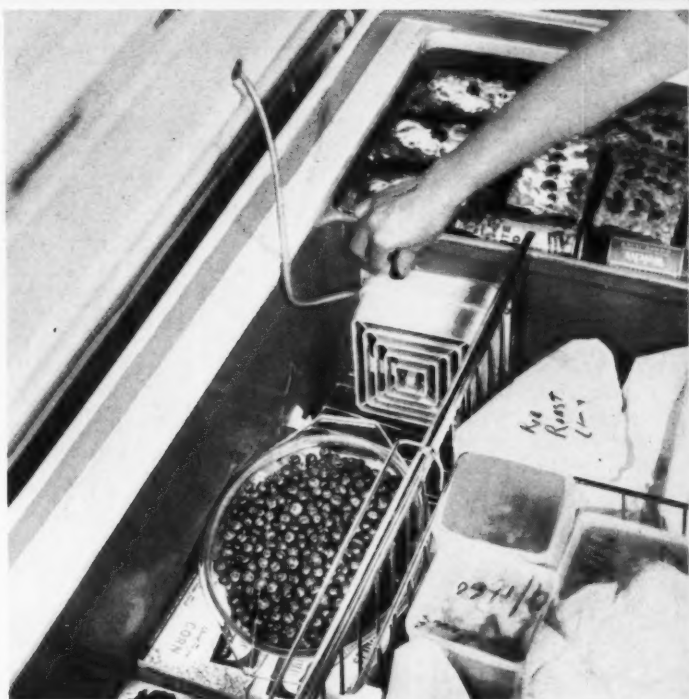
CONSULT YOUR CLASSIFIED PHONE BOOK UNDER ALUMINUM PRODUCTS





Top-of-the-line Mark 61 is a refrigerator, freezer and automatic ice maker combined. Magnetic door gaskets eliminate latches, hold door closed.

(Right) — A fast freeze fan mounted in a special louvered port of the chest-type freezer (Model HI-21H shown) blows jets of cold air against foods, makes them freeze up to twice as fast as before. Fan is an optional feature.



A convenient bleach dispenser featured in the compact gas combination washer-dryer automatically adds diluted bleach during the last four minutes of washing. Combined action of detergent and bleach gives a cleaner wash. Operating instructions are printed under hinged lid of dispenser compartment. The washer-dryer also has a detergent dispenser.



## New 1961 products by Whirlpool

Three deep, slide out basket shelves in the upright freezer Model HW-19V bring food out to the user for quick selection. Open grids in shelves keep ice air circulating, help maintain constant "zero-degree" temperature in all the compartments of the freezer.



Drastic dimensional reductions effected in the 1961 compact combination washer-dryer (left) from its 1960 counterpart (right) is illustrated in this photo. Despite reductions in size, the space-saving combination line has the same ten pound wash load capacity, and still utilizes the Whirlpool Corp.'s exclusive filter stream action.



# SEASON'S GREETINGS

May peace and contentment and good health  
be yours throughout the coming year.

*Chicago Vitreous* **CORPORATION**  
A Division of The Eagle-Picher Company  
1425 S. 55th Court, Cicero 50, Illinois







## CLIPPINGS FROM 1960 EDITORIAL PAGES

### Whose job is it? . . . (January • 1960)

ANY READERS who have had occasion to purchase appliances from "retailers" might have their own ideas concerning the job to be done to bring "high standards" back to the average retail dealer's establishment.

There is little question that the appliance manufacturers have work to do in this direction, as do all segments of the manufacturer-distribution chain. Regardless of who is to blame for the present "low" in retail selling, the manufacturer will always be saddled with a great percentage of the responsibility.

Nevertheless, a shopping trip by any retail buyer will certainly disclose conditions in retail selling that can hardly be placed on the shoulders of the product manufacturers.

In many stores, fortunately not all, there is an utter lack of regard for the retail buyer, his interests, or his wants.

Selling-up certainly is a lost art in the average appliance outlet. In fact, "selling" in a true sense is sadly lacking in any constructive form.

The signs would point to the fact that appliance buyers are interested in conveniences, beauty, and *quality*, and not just price alone. Although there may be some agreement on this point, the fact remains that the idea has not penetrated to the retail sales management — or at least not to his salesmen who make the customer contacts.

### Here comes the ice maker . . . (March • 1960)

IN OUR OPINION, the advance which stands a better chance of obsoleting all earlier refrigerators than any other single feature is the automatic ice maker. It isn't likely to accomplish this end if it is incorporated in the lines of only one or two major manufacturers, but if it becomes generally used throughout the industry so that the average homemaker with an older refrigerator receives a "home demonstration" in the home of her friend, the demand could easily snowball.

### Heat pumps and air-conditioning . . . (May • 1960)

CLIMATIC CONDITIONS in Florida offer a great opportunity to the manufacturers of air-conditioning equipment — and believe it or not, heating equipment (for minimum requirements) also. Here, the heat pump has its best opportunity to prove its worth.

The opportunity, however, is not without its responsibilities and its hazards. Salt air can prove disastrous to *any* exposed metal product. Then, too, equipment designed to provide cooling-heating at temperatures above 40° F. just *may* be required to operate at temperatures below this temperature. . . .

Why not give consideration to the use of materials with greater resistance to salt air corrosion — at least for the sea coast markets.

Check on the possibility for simplified control systems and instructions that can be followed by any transient user.

Encourage the stocking of major components at points within a reasonable distance of users in sections so important to the product involved.

Question the advisability of selling reverse-cycle units that do not have provision for auxiliary heating units to take over when the weatherman turns on the "cold" in sections where balmy weather is normally expected.

The thousands of units in use in Florida can be the forerunners of many, many thousands more, if manufacturing progress and service to the user can keep ahead of field requirements.

### New ad practices code . . . (August • 1960)

THE AMERICAN HOME LAUNDRY Manufacturers' Association released under Chicago date line of June 24 a booklet including "Recommended advertising practices for the home laundry appliance industry." Also included in the booklet are Federal Trade Commission "Guides against deceptive pricing," "Guides against bait advertising," and "Guides against deceptive advertising of guarantees." . . .

Even though 100 percent cooperation may never be obtained at all levels, this certainly represents a constructive move in the right direction toward industry self-government to eliminate requirements for government intervention.

If the new code enjoys the degree of success hoped for, it may well serve as a guide for other segments of the metal products manufacturing field.

### Progress is not a straight line . . . (September • 1960)

THE CRYING TOWELS ARE OUT . . . in the home appliance industry, and those of us who have observed the industry for 30 years or more would be greatly surprised if this weren't so.

Like many other industries, the appliance field has had its ups and downs over a long period of years. Nevertheless, when there is a slowdown in the industry, the result always seems to be the same. Both at the OEM and supplier levels there is much disappointment and use of crying towels because, as history will show us, the consistent upward trend in the appliance sales picture is not a straight line. . . .

Any sales manager or top management man will say that this is the time to put on added sales pressure and back it up with a strong and consistent advertising program. On the other hand, the great majority of the companies in the field will pick sales cost, sales expense, and advertising as the first places to cut when there is any downward trend in the sales curve.

That's why those companies whose management men have the fortitude to do what they know is right (and have the money to back it up) almost inevitably come out of a slowdown in a better competitive position.

*Dana Chase*

EDITOR AND PUBLISHER

## New Robertshaw thermostat plant

**R**OBERTSHAW-FULTON CONTROLS CO., a leading manufacturer of domestic and commercial controls, officially opened its new Robertshaw Thermostat Div. plant



F. H. POST

along the Pennsylvania Turnpike near the New Stanton interchange, on Thursday, October 20, with a tour and luncheon for 200 invited guests. Visitors were welcomed by Thomas T. Arden, president of Robertshaw-Fulton; Frank H. Post, vice president and general manager of Robertshaw Thermostat; and other corporation officials. A highlight of the official ceremonies was the lighting of the first of several gas lamps, which border the reflecting lake in front of the main office building, by Christy Payne, Jr., of the Consolidated Natural Gas Co.

The new thermostat plant is located on a 267-acre tract with seven and a half acres under roof. The colorful building uses aluminum sandwich panels extensively. The company offices are completely gas air conditioned, and both offices and manufacturing areas are gas heated. Provision is made for a complete change of air in the plant six times per hour.

Robertshaw Thermostat Div. is engaged in the manufacture of domestic controls for gas ranges, gas dryers, and other gas appliances. The parent company's products include a much broader line of temperature and pressure control devices, instrument systems, and electrical switches and relays. With corporate headquarters in Richmond, Va., Robert-



The first plant at Youngwood, Pa. was built in 1914. Prior to that time the plant was located in Pittsburgh and was known as the House Service Utilities Mfg. Co.

shaw-Fulton has eight U.S. manufacturing divisions and two research centers. Subsidiaries or affiliates are located in seven other countries.

One type of control which was started in production in 1938 has had a total production of 26 million units.

One interesting section of the plant is the repair division, where it is indicated that controls as old as 25 and 30 years are still being replaced.

Another outstanding fact in connection with this plant operation is that the average seniority of the plant workers is in excess of 20 years. MPM

### BRIEF FACTS ON NEW ROBERTSHAW THERMOSTAT PLANT

**DAILY CAPACITY** — 12,000 complete controls  
**FABRICATION** — 44 presses, 55 bar-type screw machines  
**NORMAL EMPLOYMENT** — 1400-1500  
**DIES IN STORAGE** — 1500 — value — \$1.5 million  
**PARKING LOT CAPACITY** — 800 cars  
**ANNUAL PRODUCTION** — approximately \$20 million per year  
**TOTAL PLANT COST** — \$4 million

Robertshaw Thermostat Division's new manufacturing plant as seen from the air looking west. Main entrance is immediately in front of visitor's parking circle (center, right). Pennsylvania Turnpike runs to right of picture.



## MPM

### Industry meetings

#### ENAMELERS CLUB

Midwest Enamellers Club Meetings, LaSalle Hotel, Chicago, December 3, 1960 and January 21, 1961.

#### HOME FURNISHINGS

International Home Furnishings Market, American Furniture Mart and Merchandise Mart, Chicago, Ill., January 6-14, 1961.

#### GAS APPLIANCES

The Gas Appliance Engineers' Society (Midwest Chapter) Meeting, Mickleberry Restaurant, Route 30, Chicago Heights, Ill., January 11, 1961.

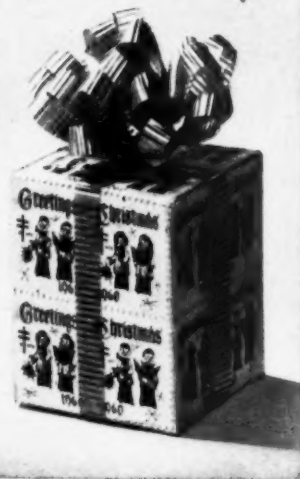
#### HOUSEWARES

The National Housewares Manufacturers' Association's 34th National Housewares Exhibit, McCormick Place (Lakefront Exposition Center), Chicago, Ill., January 16-20, 1961.

#### MAINTENANCE & ENGINEERING

The 12th Annual Plant Maintenance & Engineering Show, International Amphitheatre, Chicago, Ill., January 23-26, 1961. (Show; January 23-26; Conference; January 23-25.)

**NO TIME OF YEAR FOR TB.**  
*Is there ever a right time? Of course not. But Christmas, more than any other season, should be a time of glowing good spirits, health and happiness. In the fight against TB, it can at least be a time of hope—when millions of Americans help by using Christmas Seals. Answer your Christmas Seal letter today.*





# MPM

## new supplies and equipment

### Airless Spray Process

Two major advancements have been made in an airless spray process, permitting controlled application of a wider range of viscosities and mil thicknesses.

One development is the re-design of the Hydra-Spray gun. Called the "Golden" Gun, this gun now features a shorter overall length with center balanced weight, and a swivel at



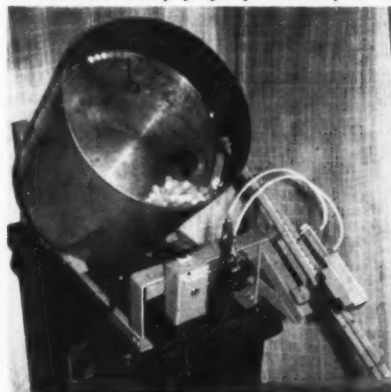
the base of the handle that allows greater maneuverability in coating flat or intricately shaped surfaces.

The second advancement is the development of the "FF" Fine Finish tip. This tip is said to provide an excellent lapping pattern which makes it possible to apply an even-mil thickness suitable for precise final finishes on appliances, furniture, and similar products.

Write Dept. MPM, Gray Co., Inc., Minneapolis, Minn.

### Rotary Disc Feeder

A newly-developed type of feeding equipment for the handling of delicate, fragile and highly finished parts is now available. This device receives a load of parts in a random position and delivers them, properly oriented, to a

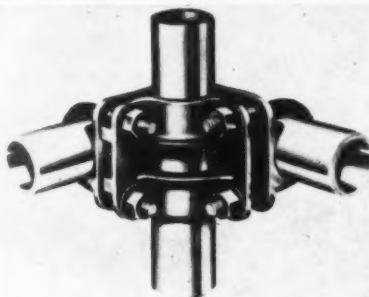


transfer track without damage, marking or scratching. The principle of operation employs a flat disc, rotating about an axis slightly off vertical. A specifically designed groove machined into the outer radius of the disc acts to orient the parts. Typical materials handled by the unit are ceramics, glass and highly finished enameled surfaces.

Write Dept. MPM, Aidlin Automation, Inc., 1613 East New York Ave., Brooklyn 12, N. Y.

### Universal Clamps

Ordinary pipe and Tube-Strut universal clamps are said to offer an economical and effective solution to storage problems and the



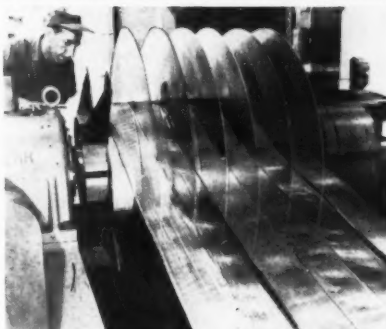
construction of storage racks and other fixtures. When storage requirements change, the racks can be quickly reassembled to meet any need.

Write Dept. MPM, Tube-Strut Corp., 2960 Marsh St., Los Angeles 39, Calif.

### Perforated Metal in Coils

Perforated metal is now available in continuous coils up to 10,000 lbs. (blank weight). The large coils are expected to lengthen production runs between loadings, cut downtime, and raise productivity for perforated metal users.

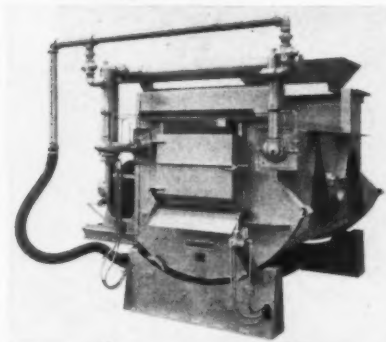
The 10,000-lb blank coils may weigh from 4000 to 6000 lbs. after perforating, depending



on the open area of the pattern. The large coils are available to 48 inches wide in 16 to 28-gauge cold rolled steel, and aluminum in round hole patterns. The coils can be slit to width as part of the perforating.

Write Dept. MPM, National-Standard Co., Niles, Mich. In Canada, write Dept. MPM, National-Standard Co. of Canada, Ltd., Guelph, Ontario.

### Reverberatory Melting Furnace



Three furnaces designed for use in sand casting, die casting and permanent mold plants are available in gas, oil or combination fuel-fired

models for direct firing for faster, more economical melting and holding of aluminum within a single-chamber furnace.

Conveniently located charging chutes allow faster hopper loading in all types. Direct firing provides maximum melting under controlled combustion conditions. Holding capacities are large to assure ample supplies of high quality, molten aluminum. Depending on type and size, these furnaces are capable of melting 150 to 3,000 lbs. of aluminum per hour with bath capacities ranging from 650 to 5,000 lbs. of molten aluminum.

Write Dept. MPM for Bulletin 5910, Hevi-Duty Electric Co., Milwaukee 1, Wis.

### Low-Cost Motor Features Removable Brushes

Externally removable brushes are now available in low-cost fractional horsepower electric motors. The Type TW series motors are said to



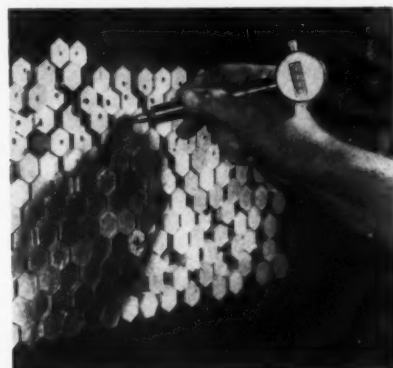
be ideal for special purpose applications where customers do simple maintenance, such as air conditioning, refrigerator compressors, hand driers, and marine uses. The externally removable brushes are said to give quick, easy replacement.

Write Dept. MPM, Redmond Co., Inc., Owosso, Mich.

### Stock Counter

The Mark\*Counter is said to reduce the number of hours needed to take physical inventories, count stock in receiving, count out materials for shipment, and count in-process items at the inspection bench. The counter counts and identifies in one operation. Each time a piece of material is touched with the pen tip, it leaves a small spot of ink and the counter clicks once. As a result, the spot of ink readily identifies each item counted, and the counter dial shows the exact number of items identified and counted. Each kit comes complete with five different color pens for color coding.

Write Dept. MPM, Van D. Mark, P. O. Box 44, St. Clair, Mich. to Page 59 →



# DOC TUFFY TO THE RESCUE

HMMMM — SPOT WELDMENTS LIKE PERFORATED PAPER. THAT'S NEW!

BURN-THROUGH! WARPING! ALL KINDS O' TROUBLE, DOC! WHAT'M I GONNA DO?

NOW YOU JUST FOLLOW THOSE TUFFALOY CATALOG SUGGESTIONS, AND YOU'LL SEE A REAL IMPROVEMENT!

TUFFALOY COLD FORMED TIPS do a better job than forged or cast tips. But you weld better with any electrode when you follow the suggestions in the Tuffaloy catalog. It has information on tips, shanks, holders, bar stock, accessories and prices. Call your Airco or Tuffaloy office.

**TUFFALOY**

**AIR REDUCTION SALES COMPANY**  
 A division of Air Reduction Company, Incorporated  
 150 East 42nd Street, New York 17, N. Y.  
 Air Reduction Pacific Company; Air Reduction Canada Limited

## Use These 2 GRIPCO® LOCK NUTS to

- Resist vibration • Save production time
- Speed application • Lower in-place cost

**GRIPCO TOPLOCK NUTS**  
 Simple, one piece design, no inserts, no separate locking devices. They increase product durability at low initial cost, increase customer satisfaction.

**GRIPCO CENTERLOCK NUTS**  
 A new, low cost lock nut, can be applied from either end, double chamfered with locking feature in the center. Can be automatically fed, will lock wherever turned on bolt.

For better service, reliability and large stocks to ensure out-of-stock delivery on all catalogued items, use Gripco Fasteners on your products. Send for samples and NEW catalog today, or consult the yellow pages in your phone book under "GRIPCO" for the representative nearest you.

**GRIP NUT COMPANY**

110 Maple Ave. • South Whitley, Ind. • Phone: South Whitley 723-5111

Subsidiary of Heli-Coil Corporation,  
 Danbury, Conn.

### Box Finger Brake

A box finger brake with 12 inch forming width, having undercut box fingers and one inch clearance through the top opening, has been introduced. Called Di-Acro Box Finger Brake No. 12, the machine has material capacity to 16 gauge steel, and is designed for use in experimental laboratories, model shops, and on short run production.

Write Dept. MPM, O'Neil-Irwin Mfg. Co., 657 Eighth Ave., Lake City, Minn.

### Soak Cleaner

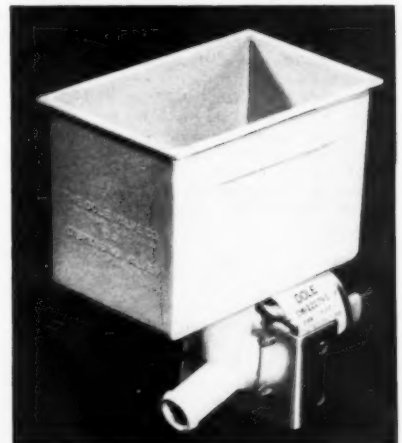
Nuvat, said to be a powerful, free-rinsing soak cleaner based on synthetic-type detergents, has been announced. It is recommended for soak cleaning in vitreous enameling lines and for general soak cleaning of steel, stainless steel, copper, brass, nickel and magnesium.

A non-dusty, non-caking product that is readily soluble, Nuvat develops no disagreeable odors or fumes, even at boiling temperatures, contains no cyanides, chromates or cresols, and creates no waste disposal problems. It is said to be chemically balanced to provide exceptional life and designed to operate effectively at comparatively low concentrations, even under heavy soil loads.

Write Dept. MPM, J. B. Ford Div., Wyandotte Chemicals Corp., Wyandotte, Mich.

### Bleach and Rinse Agent Dispenser

A bleach and rinse dispenser has been developed and is being produced for manufacturers in the home laundry field. The dispenser permits bleach or rinse agents to be in-



roduced automatically at the proper point in the machine cycle. The bleach is introduced after the wash cycle begins, and the rinse agent is delayed until the final rinse stage. Both products are pre-loaded into the dispenser reservoirs and are dispensed automatically by the cycle control of the washing machine.

Write Appliance Control Sales Dept., The Dole Valve Co., 6201 Oakton St., Morton Grove, Ill.

### Protective Coatings

Two protective coatings are now available. Thermo-Cov, a coating for all engineering materials that require protection from corrosion. The newly developed coating resists temperatures over the range 0 to 1200° F., and is available in any pastel or solid color. The coating can be brushed, sprayed or dipped.

Insul-Cote, a coating for all engineering materials that require protection from impact and corrosion. The newly developed coating resists temperatures over the range 0 to 1500° F., and has excellent sound absorbing properties. This coating is also available in any pastel or solid color.

Write Dept. MPM, Lynn Porcelain Enameling Co., 1541 Marion St., Grand Haven, Mich.

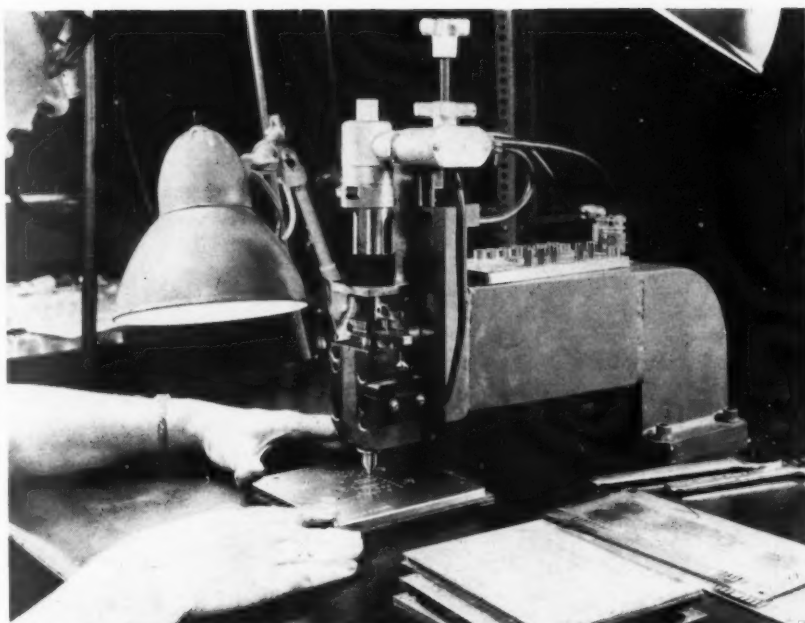
# MPM

## suggestion box

A NEW METHOD of precision drilling circuit boards with semi-automatic equipment has been announced by Librascope Div., General Precision, Inc., 308 Western Ave., Glendale, Calif. The new "gang" drilling produces circuit boards which are suitable for machines which automatically insert components.

The development of precise drilling techniques was necessary, according to Lewis W. Imm, president, when Librascope switched over to automated component assembly methods. Holes for mounting components by machine must be drilled with extreme precision to insure that the machines are able to place each lead correctly.

The semi-automatic drilling equipment was designed by the division's own Industrial Engineering department, and was built to specifications by subcontractors. Since the new equipment

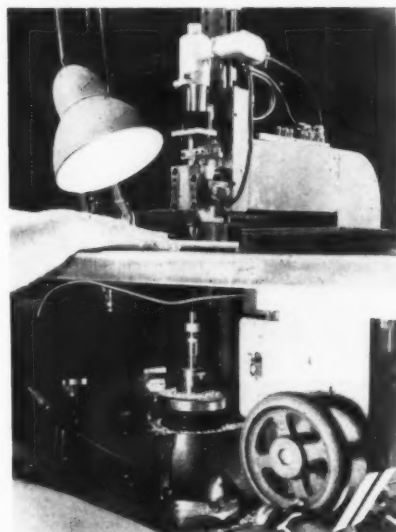


*A special positioning "finger" is guided along an etched drilling pattern in fixture. As the finger drops into each indentation in turn, the operator touches a toe switch and a special carbide drill located beneath the table drills a hole in precisely the right spot. Unless the finger is in the center of the indentation, drill will not operate. Each fixture holds five circuit boards for drilling.*

## Precision circuit board drilling method

**rejects go down and output up as a result of new manufacturing process**

*Operated by toe switch, a special carbide drill located beneath the table rises at a controlled rate and turns at a pre-set speed. All five boards are drilled at the same time, and the drill "bottoms" in the reinforced plastic backing on the fixture plate.*



was installed, reject rates have dropped drastically, and output of drilled boards per operator has risen.

The semi-automatic drill consists of a table, a special positioning "finger" located above the table, and an electrically-controlled drill below the table.

An operator gangs five circuit boards by placing them in a special positioning fixture. This fixture is a rigid metal plate, backed by reinforced plastic. The surface of the plate contains a drilling "pattern" etched into the metal, with positioning indentations to correspond to the hole to be drilled.

The five boards are held in alignment by holes which are precision drilled before the circuit boards are etched. Most of the manual and automatic production steps each board goes through depends upon these holes for precise alignment.

The fixture, with the boards, is placed metal plate up on the drill table, and the special positioning finger is guided along the drilling pattern by the operator. As the finger drops into each in-

dentation in turn, the operator touches a toe switch and a special carbide drill, located below the table, does the drilling.

The drill is completely automatic, rising at a controlled rate and turning at a pre-set speed. The process is provided with safeguards, which prevent the drill from operating unless the positioning finger is located directly in the center of an indentation on the fixture's pattern.

All five boards are drilled at the same time, and the drill "bottoms" in the reinforced plastic backing of the fixture. At the completion of the stroke, the drill returns to the rest position and the finger is guided by the operator to the next indentation.

Precision circuit boards are required in a majority of the special computers and data processing equipment which the firm produces for industrial and defense markets. It also produces special recording instrumentation and electro-optical equipment.

Use of the new drilling technique has produced precision drilled boards which are adapted to the special component inserting equipment used on the production line, and has increased the rate of output from the drill press section.





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## **LITTELL** COIL STOCK STRAIGHTENERS

The trim look of these Littell Straighteners is widely copied, but not their performance! They take the curve out of coil stock with efficiency that only Littell engineering experience can assure.

Straighteners shown handle stock .010" to .125" thick, up to 12" wide. Variable speed drives. Electric Clutch and Brake Models. Hydraulic Drive models.

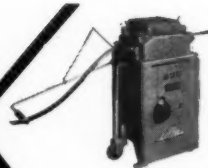
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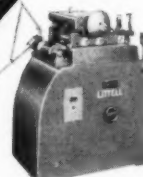
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Model 208 for  
thin stock and  
parts to 8"  
wide, .010" to  
.040" thick.



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thick.



Model 412 for  
stock up to 12"  
wide, .040" to  
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# MPM

## Industry news

### New Press Equipment Added

O'Keefe & Merritt Co., Los Angeles, has announced installation of two full-eccentric-type presses as part of the appliance manufacturer's long-range expansion and modernization program.

The installation consists of one 300-ton capacity press, and one 200-ton model. The company will fabricate range tops, panels, doors, frames, oven liners, and other parts on the new presses. The two units are equipped with pneumatic die cushions and are capable of 20 strokes per minute.



O'Keefe and Merritt personnel checking the first burner box formed on the new 300-ton press are, from left to right: Frank Breckenridge, executive vice president and general manager; Pete Delgado, operator; Robert Moyer, vice president in charge of manufacturing; and Wendell Stacy, industrial engineer.

### Admiral Forms New Division

Admiral Corp. has established the Ensign Div. to handle the production and sales of automatic record changers, wireless remote controls and other products to industry. John R. Siragusa has been named general sales manager of the new division, which is currently appointing sales representatives in key areas of the country. He joined Admiral in 1955.

### Mathes Expands Facilities

The Mathes Co., Div. of Glen Alden Corp., Marble Falls, Texas, has announced a \$75,000 expansion program. This is the second expansion since the

entire plant for manufacturing air conditioners was moved to Marble Falls from Fort Worth last February.

Included in the current expansion is an additional warehouse of 5000 sq. ft. Another building, of 10,000-sq.-ft. capacity, is being built for storage of steel, aluminum, and other production materials. Another project involves the installation of a refrigerant storage and distribution system which will enable Mathes to purchase refrigerant in tank car lots.

### Coin-Op Association Formed

The National Automatic Laundry and Cleaning Council has been formed by 11 manufacturers in the coin-operated laundry and dry-cleaning field. The Council, managed by Clinton S. Darling, is scheduled to open offices in Chicago about December 1.

H. J. Mitchell of Philco, chairman of the Council's executive committee, said, "The Council will concern itself with safety, health and other standards in automatic laundries, especially with respect to machine design and installation."

### National Rejectors Introduces \$1 and \$5 Bill Changer

A production model of the new \$1 and \$5 bill and coin currency changer manufactured by National Rejectors, Inc., was introduced recently in Chicago's Conrad Hilton Hotel.

The new changemaker electronically validates and accepts genuine U. S. currency and rejects counterfeits and foreign currency. Said to be the first machine ever produced to handle bills of more than one denomination, it returns convenient change for a \$1 bill, and four \$1 bills and change for a \$5 bill at the push of a button. It also makes change automatically for quarters and half-dollars.

The unit is enclosed in a turquoise-green and gold console cabinet about the size of a large, upright television set.

NRI, a subsidiary of Universal Match Corp., expects to have some 250 of the changers in public use by the end of 1960. By the end of 1961 the company anticipates that 5000 of the currency-handling devices will be in use in changers, automatic merchandisers, race-track wagering machines, and still other applications.

The changer is offered on a 12-month lease basis, with the company providing insurance for damage to the unit for fire, theft, and vandalism, excluding its monetary contents. The automatic mer-

### Residential Marketing Dept.

#### Organized by Westinghouse

Westinghouse Electric Corp. has announced the expansion of its Total Electric Home program into a newly formed organization — the residential marketing department.

William H. Loeber, former Total Electric Home marketing manager, has been named manager, residential marketing department. He will report to Chris J. Witting, vice president, consumer products, and will be headquartered at the company's offices in New York City.

### Maytag's Payne Discusses

#### "The Serviceman's Future"

Appliance servicemen must keep pace with technological advances made in products or they will become "parts changers with only specialists doing the repair work."

The statement was made by S. R. Payne, The Maytag Co.'s general service manager, principal speaker at a banquet highlighting the third annual convention of the Appliance Profession Association. The group, which is com-

chandisers also will be available on lease from Unimatic Merchandisers, Inc., a Universal subsidiary formed for this purpose. Unimatic will buy the finished components from National Rejectors and National Vendors.

Simplicity of maintenance and servicing of the new \$1 and \$5 electronic currency changer of National Rejectors, Inc., is shown here, as a service technician removes vertical column in which one-dollar bills are stored for dispensing. Entire interior of unit, which is built in modular system for quick and easy replacement of components while servicing, rolls out from front of cabinet for easy access from sides and top.



posed of dealers and independent service companies throughout California, met recently in Anaheim.

Speaking on "The Serviceman's Future — Fame or Fiasco?" Payne said that service is becoming more technical because appliances are becoming more complex. "As it should be," he continued, "customers are today and will tomorrow be more demanding of both you [servicemen] and the product."

Payne cited U. S. Department of Commerce figures showing the rapid growth of the appliance service industry. Income of independent appliance repair firms grew to three-quarters of a billion dollars in the period between 1954 and 1958, or an increase of 61.5 percent.

### Midwest GAES Chapter Meets

A discussion of pilotless direct ignition for gas appliances highlighted a recent meeting of the Midwest Chapter of the Gas Appliance Engineers Society. The group met November 9 at the Mickelberry Restaurant in Chicago Heights, Ill.

Gerry Powell, White-Rodgers Co., and Reno Vicenzi, Controls Co. of America, explained and demonstrated



POWELL



VICENZI

their firms' direct ignition equipment for gas appliances. Noting that pilot flames account for 60 to 75 percent of service complaints on gas appliances, the two speakers said the adoption of direct ignition systems will result in more dependable gas-fired equipment.

White-Rodgers' device is designated as "Direct Lite," and the Controls Co. model is called "Spark Lite."

The next Midwest GAES meeting will be held January 11 at the same site.

### Aluminum Siding Plant Begun

U. S. Aluminum Siding Corp. has broken ground in Franklin Park, Ill., a Chicago suburb, for a new \$2 million

plant called "the most modern and up-to-date of its kind in the industry."

The plant, which is expected to be in operation by March 1961, will contain approximately 66,000 sq. ft. of operating space as well as offices. During the first phase of the expansion 200 or more will be employed.

### Sales, Earnings Reported For Appliance Firms

Financial reports issued by appliance manufacturers reveal the following figures:

**Westinghouse** — Net income after taxes

in the first nine months of 1960 increased eight percent over the corresponding period a year ago to \$60,680,000, or 1.71 a common share. Net income in the first nine months of 1959 was \$56,225,000, or \$1.59 a common share.

**Caloric** — Third quarter sales exceeded the comparable period last year by nine percent, with the month of September showing a 26 percent gain over 1959. It was the third straight quarter in which the firm set a sales record, and the fourth quarter is expected to surpass the July-August-September period.

## ANNOUNCING...

## TWO MAJOR ADVANCEMENTS IN AIRLESS HYDRA-SPRAY EQUIPMENT

### 1 NEW GRACO HYDRA-SPRAY "GOLDEN" GUN

This lightweight gun features a new principle in trigger design that makes it equally efficient for high volume fine finishing or protective coating work. A light trigger pull creates an immediate, precise spray pattern with no lag to cause leaks or spitting.

Paint hose attachment is another exclusive feature on Graco's cold airless spray gun. The single hose enters the gun handle with a special swivel attachment. This design improves gun balance and gives the operator more freedom with less fatigue.

- Lighter than air spray guns
- Swivel hose attachment at handle
- Light trigger action
- Immersed needle . . . no leaks
- Controlled volume . . . no spitting
- Tungsten Carbide valve and seat

## NOW—AIRLESS SPRAY ECONOMIES FOR FINE FINISHING WORK

### 2 NEW GRACO "FF" FINE FINISH TIPS

Total atomization of paint is now accomplished inside the spray tip. The new tips have a double action . . . First, the inner tip creates the usual round spray pattern . . . Then, the outer tip, through further atomization, forms the final, diamond-like pattern shown at right.

The "FF" pattern makes it possible to apply an even-mil thickness suitable for precise final finishes on furniture, appliances, automobiles and similar products. *You have airless spray economies for fine finishing work.*

- Total atomization—no tails
- Wide range of tip sizes
- Excellent lapping pattern
- Even mil thicknesses
- Wide range of viscosities
- Tungsten Carbide orifices

# GRACO HYDRA-Spray

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**Waste King** — A net loss was reported for the first half of the fiscal year, but a turn to profit is expected for second-half operations. The appliance and technical products manufacturer showed a net loss of \$1,988,069 for the six months ended September 30, on sales of \$17,425,422, a 6.7 percent decline from sales of \$18,686,112 for the same months a year ago. Last year's first-half earnings were \$611,315.

**Roper** — Net sales for the 40 weeks ended October 8 were \$21,610,885, compared with \$25,180,470 for the comparable period last year. Profit for the

1960 period was \$711,324, or \$2.63 per share, compared with a profit of \$287,236, or \$1.08 per share for the 40 weeks ended October 10, 1959.

**Rheem** — A recent report says the company is in its "best financial condition in four years and in a sound position to move ahead with an expanding economy." The report said comparative balance sheets for December 31, 1956 and June 30, 1960 showed that debt (notes, bonds and preferred stock) was reduced \$34,900,000, investments were increased \$6,900,000 and accounts payable and other liabilities were decreased \$7,900,-

000. Net sales of foreign affiliated companies of Rheem for the seven months ended July 31, 1960 were an estimated \$33 million, 30 percent higher than in the similar 1959 period. Profits before local taxes of an estimated \$3 million were 15 percent higher.

### Financial Reports Encouraging

Among the favorable financial reports recently released are the following:

**Electric Autolite** — Consolidated net earnings for the nine months ending September 30 amounted to \$157,673,987, an increase of 9.7 percent over the first nine months of 1959.

**Air Reduction** — Sales for the nine-month period ending September 30 were a record \$155,448,564, compared with sales of \$151,052,893 for the first nine months of 1959, the previous high.

**Pittsburgh Plate Glass** — An increase in both sales and earnings for the first nine months of 1960 has been reported. Sales for the period were \$482,217,227, approximately eight percent higher than the same period of 1959. Net earnings during this nine-month period of 1960 were \$38,101,121, or \$3.77 per share. For the same period in 1959 net earnings were \$34,064,967, equivalent to \$3.37 per share of stock now outstanding.

**Crown Zellerbach** — Earnings for the first nine months of 1960 were \$30,608,000, a 5½ percent increase over the same period in 1959. Net income per share was \$2.15, compared with \$2.03 during the first nine months of 1959.

### LFC Receives Contracts

Government contracts totaling three quarters of a million dollars have been awarded to Landers, Frary and Clark. An order from the U. S. Army Quartermaster for \$124,000 worth of aluminum containers increased the company's food container contract to in excess of \$700,000. The containers are produced by the company's Stanley Div. and consist of a double-wall aluminum container with separate inserts.

### 1961 Plant Conference Set

Speakers from a broad cross-section of industry will address the 1961 Plant Maintenance & Engineering Conference in Chicago, January 23-26. The conference is held annually during the first three days of the Plant Maintenance & Engineering Show.

Morning sessions of the conference will take place at the Amphitheatre and evening sessions at the Palmer House.

(More News on Page 64 →)



EXCLUSIVE BY GRACO ... PATENTS PENDING

## Westinghouse plans new sales strategy for its "Diamond Jubilee" appliances

a new appliance dealer franchising program included in '61 sales plan

AT A RECENT PRESS CONFERENCE, John Craig, vice president of Westinghouse and general manager of its Major Appliance Div., and J. J. Anderson, the Division's marketing manager, outlined marketing plans for the company's 1961 "Diamond Jubilee" line of appliances. The conference was followed by the first of 14 meetings previewing the 1961 major appliance lines for distributors and dealers.

According to Craig and Anderson, Westinghouse has conducted the most thorough analysis of its franchise dealers that has been conducted in the last 15 years. As a result, a completely new appliance dealer franchising program is under way. All dealers will be consulted, studied, and all franchises will be new (Diamond Jubilee franchises) for 1961.

Among the pledges Westinghouse is making to dealers are guarantees of price protection, competitive and flexible finance plans for retail sales and stock, and counsel and business management.

According to Anderson, the policy calls for the fewest dealers needed to sell a fair share of industry, thus assuring the individual dealer opportunity for good return on his investment.

Westinghouse has completely reorganized its product lines, distribution, service, and financing, and feels it now has a complete approach to the dealer to build a good, solid dealer structure.

The first step to revitalize manufacturer-distributor-dealer relationships was the formation of a nine-man national dealer council. The council will work with factory executives on franchise policy and also on quality control and product planning. Westinghouse distributors are organizing dealer councils in their respective areas.

Under the terms of the franchise arrangement, a dealer is required to implement local advertising, provide for sales training, carry adequate displays, etc.

Commenting on the fact that 1960 would probably show about an 8 per cent drop in major appliance sales, Anderson answered the question of

"Why?" by saying, "We aren't doing the things we used to do to sell appliances." Westinghouse selected its Diamond Jubilee year as the time to produce maximum product quality and develop maximum sales power.

In a dramatic four-hour preview of its 1961 line of major appliances, refrigerators were the first product featured. There are ten models in the new line, five of which are "frost-free." Shelf front interior trim is now aluminum up and down the line, and crisper pans in various sizes (including full width) are porcelain enameled steel. Center drawer models have laminated plastic top sections, aluminum drawer fronts, and organic finish on bottom doors. "Frost-free" will be a top sales point for '61. At the preview, the first Westinghouse ad on this feature was shown as it appeared in October, 1960 issues of national magazines.

A line of three attractively designed dehumidifiers was shown to feed a market that has less than five percent saturation.

Westinghouse is pushing a "guarantee" on combination washer-dryers to help accelerate business growth rate. The combo transmission carries a five-year guarantee.

In the regular line of washers and dryers, accessibility for service was thoroughly demonstrated. Front and top panels can be readily removed for accessibility to practically all parts which may require service.

A complete line of 30 and 40-inch ranges was shown. Top-of-the-line models include such features as fog-free oven door windows.

In a closing message to the dealer-distributor meeting, John Craig stated that he expects business on major appliance items to be "about the same" for 1961 as during 1960. He stressed improved selling at the retail level as the effective way to increase the "appliance" share of consumer spendable income in the face of increased expenditures for recreation, vacation trips, etc.

(See "New 1961 products by Westinghouse," Page 51)

## Industry news

→ from Page 63

### Acorn Consolidates Facilities

Acorn Sheet Metal Mfg. Co., Inc. is consolidating all manufacturing facilities in a new building now being built in the Franklin-Mannheim section of the Clearing Industrial District, Franklin Park, Ill.

The plant will be completely equipped for metalworking with shearing, punch press, press brake, and welding equipment; finishing equipment includes two complete and separate systems for painting and baking.

### Mallory Building New Plant

Mallory Controls Co., a division of P. R. Mallory & Co., Inc., has started construction on a new 140,000-sq.-ft. plant in Frankfort, Ind.

The new plant, which is located on a 45-acre tract and designed for future expansion, will employ approximately 550 persons when it gets into full production in the spring of 1961. In announcing the new plant, G. B. Mallory, president of P. R. Mallory & Co., indicated that the Mallory Controls Co. anticipates a volume increase of 40 percent in 1961.

### Design Firm Formed

The incorporation of a new industrial design firm in Hopkins, Minn., has been announced. Known as Scharfenberg, Polivka and Gale, the new firm will specialize in product development, styling, architecture and interior design, packaging and model making.

The three principals are George T. Scharfenberg, John N. Polivka and John A. Gale. Scharfenberg's background includes eight years with the Sunbeam Corp. as chief designer for the appliance division and two years with General Motors as a senior styling designer. In 1952 he formed a partnership with Polivka, of which the new firm is an outgrowth. Polivka's experience includes ten years as head of industrial design for General Mills' appliance division.

### Servicing Subscription Offered

Servicemen who want complete information about each new General Electric radio and portable phonograph at the same time the product reaches the market can get it through a new subscription service announced by the company's Radio Receiver Dept.

The subscriptions will run for one year and will include comprehensive service manuals on each new General Electric radio and portable phonograph.

## Enamelers Announce Meetings

The Midwest Enamelers Club has announced dates and topics of two winter meetings. A meeting in Chicago's La-Salle Hotel on December 3 will feature a paper by Jason M. Zander and Richard Delott of Chicago Vitreous Corp. on "A New Production Method of Metal Preparation for Special Steels and Conventional Enameling."

Two papers will highlight a meeting on January 21, 1961, also in the La-Salle. John Ade of Sunbeam Equipment Corp. will discuss "What's New in Enameling Furnaces?" and G. A. Cairns, Macco Products Co., will deliver a talk on "What's New in Metal Cleaning?"

## Presteel Award Winner Named

The Presteel Award, which is given by Worcester Pressed Steel Co. each year to an individual or institution who has made a substantial contribution to enlarging the field of metal stampings, has been given to Clement C. Caditz, president of Northern Metal Products Co., Franklin Park, Ill.

In making the award, the Pressed Metal Awards Committee of the Pressed Metal Institute cited Caditz's development of cost control systems for stampers, his development of "make or buy"

## Furnace Goes

### "Piggy-Back"

Too big to be carried on the highway by truck without special permits, a Ferro Corp. furnace for firing porcelain enamel on aluminum was shipped via the B & O Railroad's piggy-back system to Mapes & Co., Lincoln, Neb. The furnace was fabricated for Ferro by Marietta Metal Products Co., Marietta, Ohio.



concepts, and his special efforts to aid his industry during postwar periods of shortages.

Last year's winner was Federico Strasser of Santiago, Chile, author of a new book on metal stamping techniques and numerous technical papers on the design and production stampings.

## Clearing Lathe Production Moved

John R. Bartizal, president of Clearing Div., U. S. Industries, has announced plans to manufacture its complete lathe line in the company's Hamilton, Ohio, facilities. This operation was

previously carried on at Clearing's Chicago plant. This move will enable Clearing to offer a much wider line of lathe equipment than was previously available at Chicago, Bartizal said.

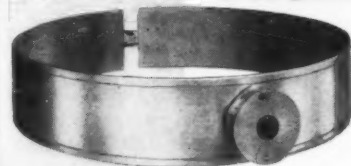
## Technical Research Center Built by Owens-Corning

Completion of a multi-million dollar Technical Research Center in Granville, Ohio, has been announced by Owens-Corning Fiberglas.

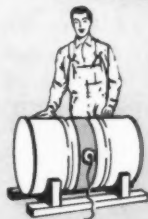
Facilities on the 154-acre tract consist of several main buildings housing lab-

(More News on Page 66 →)

## ACRA ELECTRIC DRUM HEATER



MELTS  
*Speeds up*  
SLOW FLOW  
MATERIALS



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55 GAL. Drum Heater #RH-1, shipping weight 10 lbs. \$29.50

5 GAL. Drum or straight sided Pail Heater #PH-5—S/W 5 lbs. \$16.75

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point bars • you name it

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149th and Lexington • Harvey, Illinois  
heat and corrosion resistant castings



# METAL PRODUCTS STATISTICS

		1960 (Units)	1959 (Units)	% Change
Gas Furnaces .....	Sept.	103,900	125,600	-17.3
	Jan.-Sept.	670,300	773,600	-13.4
Gas Boilers .....	Sept.	19,394	19,787	-2.0
	Jan.-Sept.	105,658	108,089	-2.2
Gas Conversion Burners .....	Sept.	22,500	27,700	-18.8
	Jan.-Sept.	97,700	109,300	-11.3
Oil-Fired Central Heating Equipment .....	August	59,262	72,893	-18.7
	Jan.-Aug.	345,380	371,466	-7.0
Gas Ranges, Free-Standing .....	Sept.	143,100	175,500	-18.5
	Jan.-Sept.	1,119,800	1,224,700	-10.0
Gas Ranges, Built-In .....	Sept.	33,700	34,800	-3.2
	Jan.-Sept.	260,200	255,100	+2.0
Gas Water Heaters .....	Sept.	223,400	243,800	-8.4
	Jan.-Sept.	2,112,200	2,287,400	-7.7
Gas Vented Recessed Wall Heaters .....	Sept.	38,200	45,200	-15.5
	Jan.-Sept.	260,700	318,500	-18.1
Gas Floor Furnaces .....	Sept.	13,900	15,200	-8.6
	Jan.-Sept.	61,700	69,200	-11.4
Gas Direct Heating Equipment .....	Sept.	126,000	225,000	-44.1
	Jan.-Sept.	833,000	1,015,300	-18.0
Gas Unit Heaters & Duct Furnaces .....	Sept.	15,400	16,200	-4.9
	Jan.-Sept.	111,800	106,400	+5.1
Gas Incinerators .....	Sept.	4,000	4,400	-9.1
	Jan.-Sept.	33,000	32,300	+2.2
Electric Household Refrigerators .....	Sept.	284,900	355,700	-19.9
	Jan.-Sept.	2,655,500	2,906,900	-9.4
Electric Farm & Home Freezers .....	Sept.	91,700	101,700	-9.8
	Jan.-Sept.	875,700	987,700	-11.3
Electric Ranges, Free-Standing .....	Sept.	80,400	83,300	-3.4
	Jan.-Sept.	638,700	707,300	-9.8
Electric Ranges, Built-In .....	Sept.	62,400	73,900	-15.5
	Jan.-Sept.	512,500	544,600	-5.9
Electric Water Heaters .....	Sept.	67,500	75,500	-10.6
	Jan.-Sept.	518,900	642,900	-19.2
Electric Dishwashers .....	Sept.	56,500	55,100	+2.5
	Jan.-Sept.	420,500	373,900	+12.5
Electric Food Waste Disposers .....	Sept.	72,800	84,200	-13.5
	Jan.-Sept.	555,200	560,600	-1.0
Combination Washer-Dryers .....	Sept.	17,824	25,461	-30.0
	Jan.-Sept.	118,895	140,554	-15.0
Washers—Automatic & Semi. .....	Sept.	279,304	301,201	-7.0
	Jan.-Sept.	1,913,304	2,193,072	-13.0
Washers—Wringer & All Other .....	Sept.	73,407	92,911	-21.0
	Jan.-Sept.	556,267	689,137	-19.0
Electric Dryers .....	Sept.	106,130	115,151	-8.0
	Jan.-Sept.	538,380	609,043	-12.0
Gas Dryers .....	Sept.	59,378	59,409	—
	Jan.-Sept.	287,424	301,383	-5.0
Vacuum Cleaners .....	Sept.	301,935	305,096	-1.0
	Jan.-Sept.	2,487,986	2,505,983	-0.7
Metal Furniture .....	Jan.-Sept.	*	*	-6.0
†Television .....	July	283,475	*	*
	Jan.-July	3,491,336	3,334,540	+4.5
†Radio (1) .....	July	890,359	*	*
	Jan.-July	9,414,879	7,936,621	+15.6
Typewriters .....	August	99,904	*	*
	Jan.-Aug.	738,869	*	*(a)
Compressor Bodies (2) .....	Jan.-Dec.		4,926,657	+37.0
Steel Barrels & Drums .....	July	2,549,388	2,856,915	-10.8
	Jan.-July	17,806,069	21,267,630	-16.2
Room Air Conditioners .....	Sept.	21,600	*	*
	Jan.-Sept.	1,327,100	*	*
Unitary Air Conditioners (3) .....	Jan.-June	185,474	*	+15.0
Heat Pumps .....	Jan.-June	19,845	*	+25.0

(1) Including auto receivers

(2) Except for household refrigerators

(3) Including heat pumps

(a) Increase over 1958

\* Not reported

† Output—all other figures are factory shipments or factory sales

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, Air-Conditioning and Refrigeration Institute, and U.S. Dept. of Commerce.

## Industry news

→ from Page 65

atories for glass, chemical, physical, mechanical and metallurgical research, reinforced plastic development, product testing, acoustical research, and a laboratory devoted to advance studies on new products and processes.

A staff of more than 250 scientists, engineers and technicians work under Dr. August C. Siefert, director of research, and Dr. Games Slayter, vice president—research.

## Kelvinator Licensee Named

A new licensee for the manufacture of household refrigerators in Sudan has been signed by Kelvinator International Corp., according to G. T. Etheridge, vice president of the American Motors subsidiary.

Coldair Engineering Co., leading manufacturer of room air conditioners in Sudan and former distributor of Kelvinator International's Leonard brand appliances, is the new manufacturing licensee, with headquarters and plant at Khartoum.

## Electroplaters to Meet

The Columbus Branch of the Electroplaters' Society will host a regional meeting and technical conference February 4, 1961, at the Deshler Hilton Hotel, Columbus, Ohio. Five technical papers will be presented.

## Housewares Show Sold Out

Every available square foot of exhibit space in Chicago's huge McCormick Place has been assigned to a record 909 exhibitors for the National Housewares Manufacturers Association's 1961 winter exhibit. The show will take place January 16-20.

The January exhibit will be the first trade show to be held in the new exposition center. According to NHMA officials, the show will offer the nation's buyers the greatest collection of housewares ever assembled under one roof and available on only two floors.

## "New Approach" in Housing Studied by Armco Steel

What is called a new approach in residential construction, "combining suburban comforts and amenities with urban conveniences," has been announced by Logan T. Johnston, president of Armco Steel Corp.

Carl Koch and Associates, Cambridge, Mass., nationally known specialists in residential architecture, have been retained by Armco. Their initial assign-



*Again-*

**IN 1961**

as in **1960**

**1959**

**1958**

**1957**

**1956**

**1955**

**1954**

**1953**

since  
**1901**

We will continue to be more interested in making possible even better porcelain enameling results for our present FRIT customers than we will be in developing new customers.

Naturally this does not mean that we are not interested in new FRIT customers—but it does mean that our *main objective* is to better serve our present customers.

Ing-Rich ever improving "Know How" is the result of the day in and day out cooperation between our topflight ceramic engineers and the practical technicians in our own large enameling plant when they have to prove their case under practical working conditions.

This Frit and porcelain enameling "Know How" has proved right valuable to Ing-Rich Frit Customers—and will prove even more valuable as we continually strive to learn and improve.

Pioneer Producer of  
LIFETIME  
Porcelain Enamel Products

**INGRAM-RICHARDSON, INC.**

OFFICES, LABORATORY AND PLANT  
FRANKFORT, INDIANA



ment is to design a multiple-family, garden-type apartment dwelling "making maximum intelligent use of steel."

"We at Armco feel that steel can do much to hold down rapidly rising housing costs — and give the American home buyer much more for his shrinking dollar," Mr. Johnston said. "For the steel industry, the housing market represents a major, relatively untapped new market. We have great faith not only in the potential market for steel in residential applications, but even more in the construction economies, durability, convenience, and aesthetic potential of steel — skillfully and intelligently applied in housing."

### Space Job to Whirlpool

Whirlpool Corp. has been awarded a contract by the U. S. Air Force to design and build America's first space kitchen. The experimental project, which is Whirlpool's initial assignment in space engineering and research, calls for the development of a unit which could provide all foods and beverages required by three space pilots on a 14-day mission.

To occupy an area approximately 10 feet long and 7½ feet in diameter within a forward section of a multi-stage rocket, the space kitchen will contain a miniaturized, thermoelectrically fueled

refrigerator and a freezer, a three-cavity oven and a built-in 2½ gallon capacity water system with its own heater.

Because of the problem of zero gravity, the space kitchen will function more as a dispensing center rather than an area in which food is prepared. Much of the food will be in pre-processed or dehydrated form, and packaged in disposable containers resembling over-size toothpaste tubes.

### 12th Western Metal Congress

Research, processing, cost reduction, testing, heat treating and advanced design will be underscored in the 12th Western Metal Congress, to be held March 20-24 in Ambassador Hotel, Los Angeles. The Western Metal Exposition will be held concurrently in Pan-Pacific Auditorium.

### Headquarters Building Planned

The Robertshaw-Fulton Controls Co. has exercised an option to purchase six acres of property on Byrd Ave. in Henrico County of suburban Richmond, Va.

Construction of the building is expected to start in late spring or early summer of 1961. It is expected to be ready for occupancy approximately a year later.

### 3 Millionth Steel Barrel Produced



The 3 millionth stainless steel barrel made by Firestone Steel Products Co. rolls off the assembly line at the Akron plant. President M. A. DiFederico watches as an inspector stamps "3,000,000" on the barrel. The company, said to be the largest producer of stainless steel beer barrels, has used more than 90 million pounds of stainless steel in production of the barrels.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

### THE A. O. SMITH APPLIANCE STORY

*an MPM special report on  
HOME AND  
COMMERCIAL  
APPLIANCE  
PRODUCTION  
at the A. O. Smith  
Permaglas Division . . .*

### COMING IN FEBRUARY

*FABRICATION, FINISHING,  
ASSEMBLY, QUALITY CON-  
TROL AND PACKAGING at  
one of the nation's leading appli-  
ance manufacturers (5 millionth  
water heater built in late 1959)  
will be covered in story and pic-  
tures in the February 1961 issue  
of MPM.*

### AN MPM SPECIAL REPORT

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

### NEXT MONTH . . .

In the January issue of MPM look for a comprehensive article on development and testing at Westinghouse . . . a detailed study of Whirlpool's modernized service center . . . engineering details of Speed Queen's entry in the combination washer-dryer field . . . and staff coverage of three important industry meetings — NEMA, ARI, and the PEI forum for plant men. See these and other features in the first issue of the new year.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

## FREE—and Important!



Handy Check Chart clarifies selection of proper types


### JUST PUBLISHED!

**Meyercord Directory to  
QUALITY TRANSFER  
NAMEPLATES  
for every surface  
and condition**

**Important Facts for your Design  
and Production Departments**

Meyercord produces many different types of Decal Transfers to satisfy the requirements of a wide variety of surfaces and conditions. Available now are Meyercord types that resist abrasion . . . resist weathering . . . and a full selection of heat resistant decals. Some types perform dual functions. It is important to you to know the characteristics of each of these *Performance Rated* transfers. To provide this information in condensed and useful form, Meyercord now offers a new brochure covering the entire subject. It's yours upon request.

Write today . . . on company letterhead, please

 **the MEYERCORD co.** Dept. X-350, 5323 W Lake St., Chicago 44, Ill.



## MPM personals

**James R. Gall** has been appointed sales manager — air conditioners, dehumidifiers, and freezers, **Admiral Sales Corp.**, it was announced by B. H. Melton, vice president, appliance division. He was formerly associated with Deep-freeze, Amana and Norge as a sales executive.

**Philip A. Fitts** has been promoted to the position of assistant sales manager of national accounts, it has been announced by Harry T. Silverman, president and chairman of the board of **Landers, Frary & Clark**. In his new post, he will assist and report to Robert E. Morrill, sales manager of national accounts, in the sales promotion and development of national accounts for the company.



GALL



FITTS



MARTIN



HARWOOD

**C. F. Abresch** has been named manager of dishwasher engineering at **Waste King Corp.**, Los Angeles. He was formerly manager of washer engineering for the **Hotpoint Div.**, **General Electric Co.**

**White-Rodgers Co.** has announced the creation of two new executive positions within the firm's sales organization. **Edward E. Harwood** becomes sales manager, original equipment manufacturer division, and **John H. Martin** becomes sales manager, wholesaler division. Before his current appointment, Harwood was manager of the firm's Cleveland region. Martin had been manager, marketing and research division.

**Harold R. Blair** has been appointed executive vice president of **State Industries**, Los Angeles, it has been announced by Arthur E. Haskell, president. Blair will coordinate the divisional functions of the firm, which include the **Awning Div.**, supplying the mobile home industry, the **Adjustez Furniture Div.**, which manufactures adjustable school furniture, plus **State Tube Div.**, which produces hot and cold rolled steel tubing for industry.

**Edmund H. Filipak** has been named product planning manager of the electric range and cabinet department of **Westinghouse Major Appliance Div.**



BLAIR



FILIPAK

**Harry P. Dunne** has been named marketing director of **Zero Mfg. Co.**'s magnesium division, according to John B. Gilbert, president. Dunne will develop national product sales and applications for the firm's magnesium fabrication business.

**Caloric Appliance Corp.** has named **Charles D. Kolkebeck** as material control manager at its Topton manufacturing plant, according to an announcement by Robert Klein, vice president of manufacturing.



DUNNE



KOLKEBECK

**Oscar V. Johnson** has been named general manager of sales of **Midwest Steel Corp.** He was formerly manager of sales, coated sheet products, of **Weirton Steel Co.**

**Charles G. Chisholm** has been appointed vice president, marketing of **Haynes Stellite Co.**, division of **Union Carbide Corp.**, it has been announced by Robert M. Briney, division president.



VOGT



HAGENSICK

**Kurt F. Vogt** has been appointed to the newly-created position of vice president, marketing for **Acoustica Associates, Inc.**, manufacturer of ultrasonic instruments and systems.

**R. L. Hagensick** has been named chief engineer of the Heating and Air Conditioning Div., **Modine Mfg. Co.** He joined the company in 1946 as product design engineer. He was named chief engineer in 1955.

**Lawrence H. Van Wassenhove** has been named advertising and sales promotion specialist, and **Stanley A. Gorski** has been named manager of marketing, at **General Electric's Appliance Control Dept.**, Morrison, Ill., according to a recent announcement. Gorski succeeds **Donald J. Harrington**, who has been appointed manager of marketing at the company's Capacitor Dept., Hudson Falls, N. Y.

**R. F. Sharon** was elected vice president in charge of the **Panelbloc Div.**, **The Bettcher Mfg. Corp.**, Cleveland, at a recent meeting of the board of directors of Bettcher. In the same action, he was made a member of the board of directors.

Sharon is currently chairman of the **Infra-Red Radiant Unit Heater Group** of the **Gas Appliance Mfgs. Assn.**

**Lyon Metal Products, Inc.**, Aurora, Ill., announced that **A. W. Piggot** has been appointed assistant manager of new product research and contract sales department, under H. G. Knuth.

**William L. Davis** has been elected executive vice president of **Emerson**  
to Page 71 →

PIGGOT

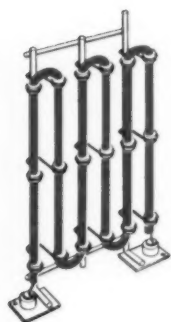


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a monster?  
call a  
specialist  
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for Heating  
Elements with  
Customer Appeal  
call the Tuttles  
in Tecumseh*



Element designed for 5 kw.,  
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**H. W. TUTTLE & COMPANY**

TECUMSEH, MICHIGAN

MANUFACTURED AND DISTRIBUTED IN CANADA BY  
CRONAME (CANADA) LTD., WATERLOO, QUEBEC



## COMING FEATURES

### GENERAL

- ★ SPECIAL REPORT ON A. O. SMITH PERMAGLAS DIV. ★  
(HOME AND COMMERCIAL APPLIANCES)
- RESEARCH AND DEVELOPMENT FACILITIES  
AT WESTINGHOUSE (COLUMBUS)
- STANDARDIZATION IN APPLIANCE DESIGN
- OPERATION OF A 12-PLANT QUALITY CONTROL SYSTEM
- A STREAMLINED APPLIANCE SERVICE PARTS CENTER
- MPM STAFF REPORTS ON MAJOR INDUSTRY MEETINGS

### DESIGN

- A NEW COMBINATION WASHER-DRYER
- NEW CONCEPT IN DISHWASHER DESIGN
- DESIGN FEATURES OF MIRRO-MATIC PRESSURE COOKER

### FABRICATION

- FABRICATION AT SPEED QUEEN
- AUTOMATED FABRICATION LINE AT WHIRLPOOL
- FABRICATING AIRLINER COOKING EQUIPMENT

### FINISHING

- NEW STRIP COATING LINE FOR STEEL AND ALUMINUM
- A SURVEY OF THERMOSETTING ACRYLIC PAINTS
- EVOLUTION OF AN INFRA-RED PORCELAIN  
ENAMELING FURNACE
- GLASS LINING TECHNIQUES AT A. O. SMITH



## Personals

→ from Page 69

**Electric Mfg. Co.**, St. Louis, it has been announced by W. R. Persons, president.

**Dr. George E. Barker** has been named vice president and director of research at the **Van Straaten Chemical Co.**, Chicago, it has been announced by Herbert van Straaten, president. In this capacity, he will direct all of the company's research in every field and on all types of products, including metal cutting, grinding and cleaning compounds.

**C. T. Perkins**, president of **Modine Mfg. Co.**, Racine, Wis., announced his retirement at a recent meeting of the board of directors. He will continue as a member of the board, and has been named vice chairman. **A. G. Dixon**, executive vice president, was elected to succeed him as president.

Modine is a manufacturer of heating, air conditioning and heat transfer equipment, and products for the automotive industry.



DIXON



AMMEL

**T. J. Ammel** has been named sales manager, O.E.M. and Mobile Products, for the York Div., **Borg-Warner Corp.**, it was announced by Austin Rising, vice president and director of marketing. In this capacity, Ammel assumes responsibility for supervision of sales and product development for compressors, compressor units and condensing units distributed to original equipment manufacturers, and the Mobile Products Group, including automotive air conditioning compressors, truck refrigeration systems and rail car refrigeration.

**Frank J. Nunlist**, formerly executive vice president of the **Mueller Climatrol Div., Worthington Corp.**, has been appointed to the new position of vice president, operations of Worthington. In his new position, he will be responsible for the activities of all of Worthington's 16 domestic operating divisions and regional engineering and service activities.

The following sales appointments have been made by E. J. Baumrucker, vice president, domestic sales, **Clearing Div.**,

**MPM** DECEMBER • 1960

## GENERAL INDUSTRIES

# Smooth Power

## AC MOTORS

1/1800 H. P. TO 1/35 H. P.

### For Extra Quiet Operation . . .



motors  
with gear  
reductions

for low-speed  
high-torque  
applications

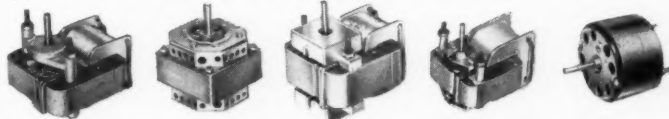
Designed for low-speed, high-torque applications, GI Gear Motors are widely used in TV Remote Control Units, Vending Machines, Timing Devices, etc. Molded nylon gears in a dirt-sealed housing insure extremely quiet running plus rugged dependability. Rotor disengages, if required, when gear train is de-energized. For reliability, plus extra silent service, specify GI Gear Motors. Precision-made, with mass-production economy.

### GENERAL SPECIFICATIONS

	MODEL 205		MODEL 308	
	Intermittent	Continuous	Intermittent	Continuous
SPEED	13 RPM	13 RPM	13 RPM	13 RPM
TORQUE	150 in./oz.	100 in./oz.	150 in./oz.	90 in./oz.
AMPS, No Load	2.5	1.25	1.2	0.6
WATTS, No Load	26	13	24	12
REVERSIBLE	No	No	Yes	Yes
CONDENSER	None	None	60 MFD	60 MFD

Above data based on 24 volts — Intermittent Duty 3 minutes on and 5 off.  
Both models can also be supplied for 115 volts — 60 cycles.

### MOTORS TO MEET EVERY REQUIREMENT



Write For Catalog and Quantity Price Quotations

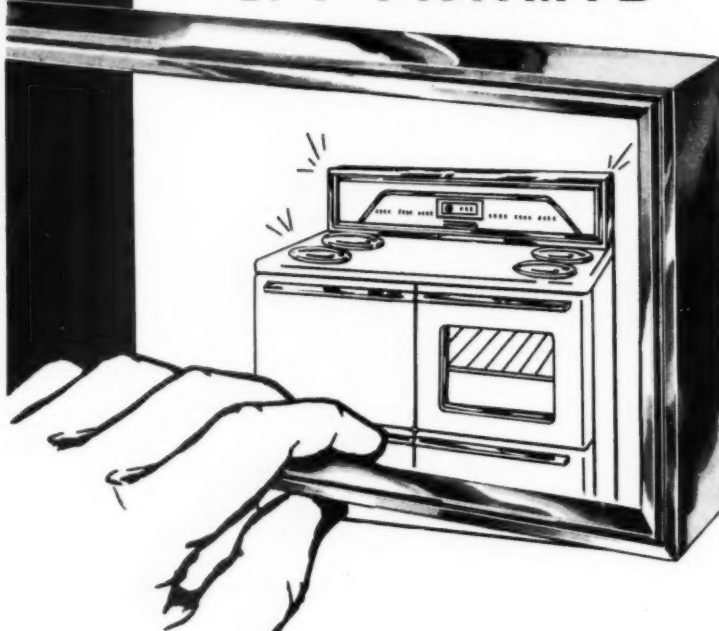


## THE GENERAL INDUSTRIES CO.

DEPT. GF • ELYRIA, OHIO



## THE **BRIGHT** TOUCH BY PYRAMID



### ADDS THE RIGHT TOUCH TO YOUR SALES!

Pyramid sparkling stainless trim adds the *right* touch that means the difference at point of sale! From simple trim to complex frames, Pyramid's wide line of metal mouldings can help you put the sale across by providing the *extra* spark that means *extra* sales.

Economical, too. Individual frames, for example, can be tailored from standard sections—providing originality at little or no tool cost. Or intricate rings can be roll formed in endless spirals—eliminating waste, yet holding close tolerances.

And if your needs are special, you'll find you'll do much better working with specialists. Pyramid has specialized in making metal mouldings for over thirty years.

Why not put this experience to work for you—today!

## Pyramid Mouldings Inc.

5365 WEST ARMSTRONG AVE., CHICAGO 46, ILL.—BRONXVILLE, NEW YORK  
WESTERN MOULDINGS INC., 1111 EAST 8TH STREET, UPLAND, CALIFORNIA

**U. S. Industries, Inc.**, Chicago: **George Herrick**, general sales manager, automotive sales, Detroit area; **Philip Delmer**, general sales manager, domestic sales; **Louis Tuglas**, manager, shear sales; **Dave Bonnar**, manager, dealer press sales; **Dean Cochran**, manager, hydraulic sales; and **Stephen Miller**, manager, machine tool sales.

**R. M. Grace** has been appointed to serve the central Ohio territory for **Macco Products Co.**, Chicago. Prior to his Macco appointment, Grace was with the consulting engineering firm of A. W. Grub.

**Charles B. Hellmann** has been named manager of timer product sales at **General Electric's** appliance control department, Morrison, Ill., according to Stanley A. Gorski, department manager of marketing. In his new position, he is responsible for sales to appliance manufacturers of the department's full line of automatic oven and minute timers for electric and gas ranges and program timers for automatic clothes washers and dish washers.



GRACE



HELLMANN

**Neal H. Hutchinson** has been appointed director of purchases for the Cleveland division of **Midland-Ross Corp.**, it has been announced.

**E. D. Gordon** has been named assistant to the president of **Sperry Rubber & Plastics Co.** Before joining Sperry, Gordon was associated with the Firestone Industrial Products Div., The Firestone Tire & Rubber Co.

**Herbert J. Zurstadt** has joined the engineering department of the **Detroit Controls Div., American Radiator & Standard Sanitary Corp.**, Detroit as a project engineer, according to an announcement by Richard L. Campbell, vice president, engineering.

**William H. Grinold**, vice president of operations, has been elected president of **The Wallingford Steel Co.**, Wallingford, Conn., a subsidiary of **Allegheny Ludlum Steel Corp.**, effective January 1, 1961.

# MPM

new industrial literature

## Bulletin on Plastic Laminate

A full-color bulletin announces new lines of wood grain and decorator patterns of Kevinite, a hard surfaced, decorative, plastic laminate. It is manufactured continuously and is available in widths of 30, 36 or 48-inches, or even increments in any length. Thickness is .036-inch, plus or minus .003-inch.

The material can be worked at temperatures from 185° F. to 285° F. without harm to the material.

Write Dept. MPM, Swedlow, Inc., 394 N. Meridian Rd., Youngstown 9, Ohio.

## Solenoid Valves and Electromagnetic Control

A bulletin covering this firm's line of solenoid valves and electromagnetic control is available. Among the many types of valves listed are two, three and four way valves, corrosion resistant valves, valves for steam and hot fluids, and types for fuel oil and gas. Several types of electromagnetic controls are covered in the bulletin.

Write Dept. MPM, Automatic Switch Co., Florham Park, N. J.

## Extruded Shapes

A catalog containing over 400 extruded shapes, including angles, channels, edgings, nosings, tees, and other shapes, is available. These forms are produced from open dies and the usual die charge has been eliminated. The catalog gives such information as width, thickness, factor, and estimated weight-per-foot. This firm produces custom extruded, fabricated and finished aluminum parts for the home appliance, furniture, building products and similar industries.

Write Dept. MPM, Aluminum Extrusions, Inc., Charlotte, Mich.

## Pre-Colored Aluminum Sheet

An 8-page, fully illustrated booklet describing Colorweld 60, a pre-colored aluminum sheet used to make commercial-industrial building products, has been published. The publication contains color swatches of all 20 standard colors offered in the line. Detailed description is given on how Colorweld is made and where it may best be used.

Write Reynolds Metals Co., Dept. PRD-39, Box 2346, Richmond 18, Va.

## Welding Metallurgy

A pocket-size booklet on welding metallurgy had been published. It is a condensed textbook on ferrous and non-ferrous welding metallurgy prepared and reviewed by metallurgists in the United States, and contains 122 pages, 45 illustrations, 25 tables and 25 diagrams.

The booklet deals with temperature changes in welding, structure of metals, mechanical properties of metals, factors influencing the properties of metals, factors affecting weldability, etc.

The booklet is available for \$2.00 per copy by writing to Dept. MPM, AWS Information Center, 33 W. 39th St., New York 18, N. Y.

## Guidebook on Retooling

This guidebook offers basic formulas for computing the dividend on payroll dollars possible by planned annual retooling. The publication records reasonable and profitable annual retooling rates as confirmed by field experience.

A companion piece to the guidebook is a handy slide rule computer for rapid calculation of your gross dividend on payroll dollars.

For information on how to procure your guidebook and slide rule computer, write to Special Projects Editor, Metal Products Manufacturing, York St. at Park Ave., Elmhurst, Ill.

## Spring Fasteners

Standard and special spring fasteners in twin-prong or cone-type impressions and push-on types are illustrated in this catalog. Data is arranged so that selection of fastener by style, screw or stud size is easily made. Information concerning tensile and torque and other pertinent design requirements is provided.

Write George K. Garrett Co., Inc., Dept. 216, Torresdale Ave. at Tolbut St., Philadelphia 36, Pa.

## Ribbon and Wire Forming Machines

An 8-page, two-color, fully illustrated catalog describing the engineering features and production capabilities of this firm's automatic high speed ribbon and wire forming machines, known as four slides, is now available.

Ribbon and wire parts, such as clips, clamps, hooks, rings, cotter pins, etc., which can be produced, are shown.

Write for Catalog 40 to Dept. MPM, The Baird Machine Co., Stratford, Conn.

## Industrial Furnaces

A bulletin describing this firm's full line of standard pre-engineered industrial furnace equipment for heat processing is now available. The brochure includes a special selection guide which will help in choosing the proper equipment in relation to the particular heat processing requirement. Twenty-three types are shown.

Write Dept. MPM for Bulletin SEC-11, Sunbeam Equipment Corp., 180-11 Mercer St., Meadville, Pa.

## Bulletin on Paint Finishing

A 12-page bulletin describing complete paint finishing systems and component units is available. The bulletin includes a pictorial story of the finishing line, pictures, descriptions and technical data of the individual component parts, construction and conveyors.

Write Dept. MPM, J. O. Ross Engineering, Div. of Midland-Ross Corp., 730 Third Ave., New York 17, N. Y.

## Chemical Cleaning with Citric Acid Solutions

A booklet, Chemical Cleaning with Citric Acid Solutions, has been issued by this firm's chemical division. The booklet has as its contents: Introduction; Acid Cleaning with Citric Acid Solutions, Ferric Ion and Ferrous Ion; Advantages of Ammoniated Citric in Chemical Cleaning; and Appendix. Included also is a graph showing proportions of citric acid and ammonia to produce ammoniate 3 percent citric acid solutions, and a graph showing reaction of citric acid and ammoniated citric acid with iron.

For a copy of Data Sheet No. 557, write Dept. MPM, Chas. Pfizer & Co., Inc., 630 Flushing Ave., Brooklyn 6, N. Y.

## Roll Formed Sections

An information folder on cold roll formed products is now available. The folder describes what cold roll formed sections are and recommends who should use them. The uniformity, accuracy, strength-weight ratio, surface finish, and versatility of these sections are gone into in detail. The unlimited number of shapes available are pointed out, as are the many end uses, for roll formed products.

Write Dept. MPM, Solar Steel Corp., 651 Lehigh Ave., Union, N. J.

## Electrolytic Process Unit

A 4-page bulletin in three colors de-

APEC...

building...

growing...

the source

for

porcelain

enamellers

FACTORY RESEARCH AND  
ENGINEERING FACILITIES  
CONSULT US

DEPENDABLE FIELD TECHNICAL  
SERVICE

AR AND NON-AR  
COLOR COVER COATS  
1500°F 1400°F 1300°F

GROUND COAT  
1500°F 1400°F 1300°F

WET PROCESS  
CAST IRON FRITS

SPECIAL GROUND COATS  
ACID RESISTANT •  
ALKALI RESISTANT • GREY

TITANIUM, ZIRCONIUM, ANTIMONY  
COVER COATS  
1500°F 1400°F 1300°F

DRY PROCESS  
CAST IRON FRITS



american porcelain enamel company

POPLAR 6-4756

• 1285 KEATING AVE. •

MUSKEGON, MICHIGAN



scribing the Model 500 Allen-Dizor is now available. The desk-size electrolytic process unit is designed to prepare hard-anodized samples in the laboratory, and to meet the demand for facilities for prototype or experimental work. In addition to hard anodizing, the unit can be adapted for conventional sulphuric and chromic anodizing, straight electroplating, chemical and electrochemical milling, electropolishing, electrolytic cleaning and etching.

Write Dept. MPM, Allen Aircraft Products, Inc., Ravenna, Ohio.

### Standards for Metal Drums

Four new American Standards for metal drums have been approved and published in a single, 8-page document by the American Standards Association. The specifications cover requirements for material, construction, embossing, shipping data, dimensions and tolerances.

American Standard Specifications for Metal Drums, MH2.11-1960 through MH2.14-1960, are available in a single publication at 50 cents. Copies of the American Standard covering the first ten containers (MH2.1-1959 through MH2.10-1959) are also available in a single pamphlet at a cost of \$1.00.

Write the American Standards Association, Dept. PR 190, 10 E. 40th St., New York 16, N. Y.

### Stainless Arithmetic

Stainless steel bars and wire can provide plenty of help with this kind of profit arithmetic. A free folder explains how.

Write Dept. MPM, Armco Steel Corp., Middletown, Ohio.

### Adhesives Selector Chart

This selector chart shows the properties of key Hysol adhesives and hardeners, their tensile shear strengths at different temperatures, and in several fuels. Also, the operating temperature range, isod impact, coefficient of thermal expansion, and numerous other criteria are indicated.

Write for Bulletin A-100, Adhesives Dept., Hysol Corp., Olean, N. Y.

### Welding Electrode Chart

A new 23 x 35-inch electrode wall chart gives description, number, color code, mechanical properties, size, current range, procedure and application information on a complete line of arc welding electrodes.

Other information covers welding symbols, welding arc, causes and cures of common welding troubles, typical deposition rates and a metal hardness conversion table. Write Dept. MPM, Hobart Bros. Co., Troy, Ohio.

### Hole Punching Units

A new catalog fully describes and illustrates the complete line of Unipunch Series "A" hole punching units for punching up to three-inch diameter round and shaped holes in up to 1/4-inch-thick materials, and Series "AH" for material up to 1/2-inch-thick. For a copy of Catalog A, write Dept. MPM, Punch Products Corp., 370 Babcock St., Buffalo 6, N. Y.

### Welding Data Book — 7th Edition

A new edition of the pocket-size Maintenance Welding Data Book, including new application and design data, has been published. The 148-page illustrated publication is the seventh edition of the Data Book.

In addition to providing a guide, indexed by application, to nearly 200 different welding rods, electrodes, and chem-



*Use*  
**Sturdy, Smooth Running,  
Light Weight**

### NAGEL-CHASE FHP V-Belt Pulleys!

Let specialists make your V-Belt pulleys and take a load off your production facilities while they cut production costs.

Nagel-Chase pulleys have been used for power transmission on compressors, washers, dryers, lawn mowers, tractors, agricultural equipment and similar applications for many years.

This company has the specialized experience and facilities to produce these pulleys promptly and economically. If your specifications call for a standard size pulley with a pitch diameter from 2.4" to 12.625" for which tools are already available, further savings can be effected.

If there's a sheave in your product—consult Nagel-Chase.

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## KNOBS

Shown above are some of the many Rogan knobs available from stock molds. Fast delivery. Special shaft holes at nominal cost. Send for details and catalog.

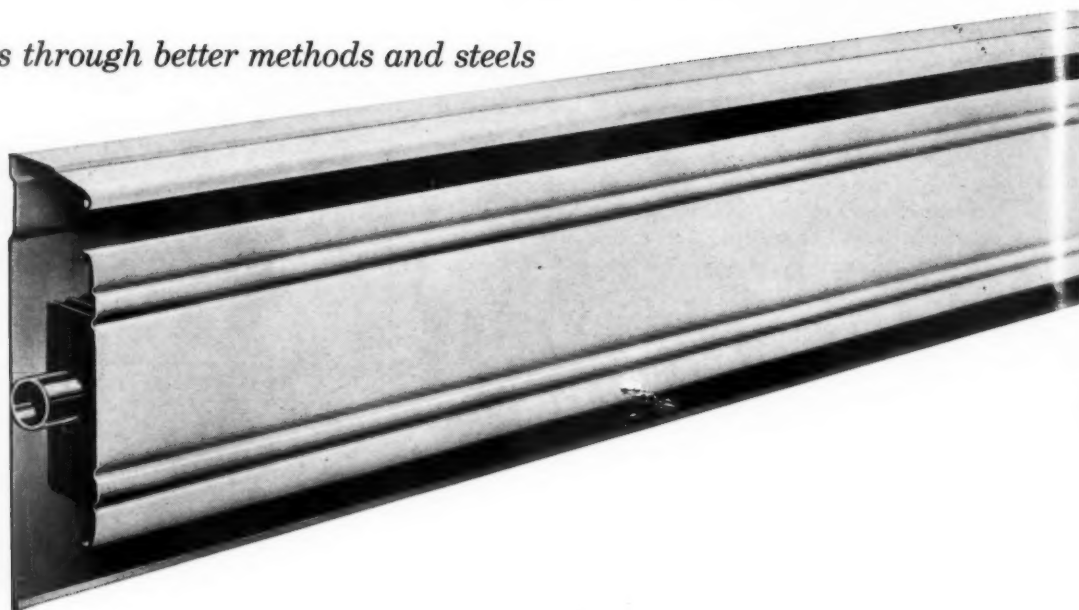
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FROM STOCK MOLDS  
OR  
CUSTOM MOLDED  
TO  
YOUR OWN DESIGN

AMERICA'S FOREMOST MOLDERS AND BRANDERS OF PLASTIC KNOBS

*Better products through better methods and steels*



With Weirzin: easy fabrication of beautiful baseboard heating panels that last and last and last.

This high quality electrolytic zinc-coated and bonderized steel sheet is produced to our customers' requirements for uniformity of gage, width and temper. This attention to quality along with the excellent corrosion resistance provided by the zinc coating puts Weirzin at the top of its category and around the bottom of an increasingly large number of commercial and residential interiors.

There, these baseboard heating panels provide a functional border of beauty that requires little or no maintenance. The chemically treated surface holds the smoothest of paint

jobs and the tight zinc steel bond eliminates all possibility of underfilm corrosion. Proof that despite the severe bending and forming it undergoes, Weirzin maintains a flawless bond between the zinc coating and the steel sheet.

Result? The fabricator enjoys the workability of a fine product and the ultimate consumer benefits from its serviceable beauty. And that's true of any product made from Weirzin.

Strong, smooth Weirzin electrolytic zinc-coated steel is manufactured by Weirton Steel Company. Its high quality is typical of the



many other steels produced by Weirton and used throughout industry to improve products, methods and profits.



Look for the **STEELMARK**  
on the products you buy; place  
it on the products you sell.

**WEIRTON STEEL**  
Weirton, West Virginia



Weirton Steel is a division of **NATIONAL STEEL CORPORATION**

ical aids, the book illustrates and explains general welding techniques and joint design hints. Write Dept. MPM Eutectic Welding Alloys Corp., Flushing, N. Y.

### Cleaning Steel Before Galvanizing

"Cleaning Steel Prior to Hot Dip Galvanizing" is the title of a bulletin recently revised to include new products developed for the metal field.

The bulletin points out that proper preparation of steel is essential before its immersion in the zinc bath, and the higher the standard of cleaning, the better the quality of the coating. It offers a choice of methods for soil removal and pickling, and shows how solvent precleaning improves efficiency and gives greater economy.

For a copy of Service Bulletin No. 80A, write Dept. MPM, Oakite Products, Inc., 117 Rector St., New York 6, N. Y.

### Catalog on Equipment for Process Industries

A 16-page catalog on process equipment has been published. Included are technical data on processing systems and vessels, conical blenders and vacuum dryers, grinding mills, the Mil-Reactor and a variety of agitation and mixing equipment. A section is also devoted to ceramics, for grinding media and linings, for catalyst suspension, and for corrosion and abrasion-resistant applications.

Write Dept. MPM, The Patterson Foundry and Machine Co., East Liverpool, Ohio.

### Bench Welders

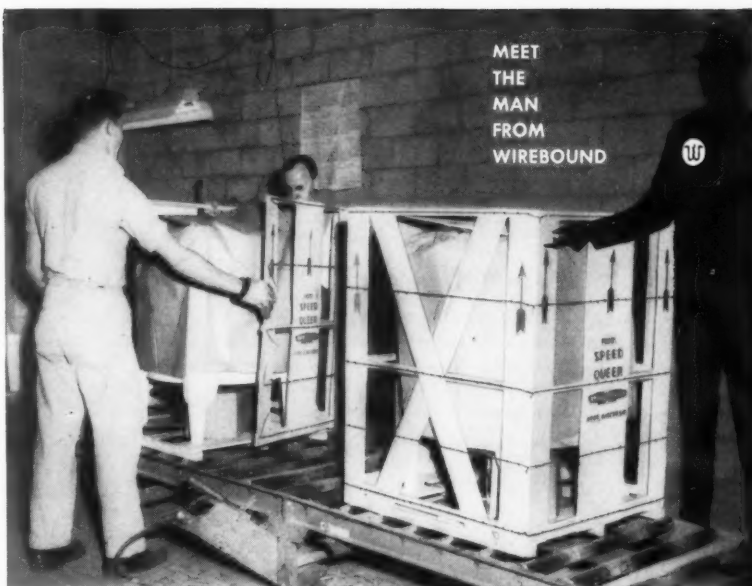
A bulletin, in color, covering this firm's line of bench-type spot welders, illustrates and describes their line of bench welders in capacities from five to 50 KVA.

Write Dept. MPM for Bulletin BA-60, The Federal Machine and Welder Co., Warren, Ohio.

### Flat Spiral Power Springs

A 12-page booklet shows this firm's line of flat spiral power springs, including two variations of a new spring design. The booklet illustrates and describes four spring types; spiral, crosscurved, stainless and integral band with and without bridle. It also provides reference data on spring nomenclature, various types of ends and centers, and lists data required when ordering springs.

Write Sandvik Steel, Inc., Spring Dept., 1702 Nevins Rd., Fair Lawn, N.J.



## "Appliances get there right in Wirebounds" ... says Speed Queen

"Wirebounds have no equal in getting our washers and dryers to dealers in top condition," reports Mr. R. M. Cornwall, director of purchases for the Speed Queen Division of McGraw-Edison Co., Ripon, Wisconsin. "The package development assistance provided us by the Man from Wirebound has helped us obtain three-way improvement of shipment protection, warehousing and packing."

**Superior shipment protection.** Wirebounds take the bumps and squeezes of shipment better than other containers. Their construction eliminates "hidden" damage.

**Economical warehousing.** Wirebounds stack high and safe... multiply warehouse floor space many times. Their strength makes possible maximum use of lift trucks.

**Fast, secure packing.** Washers and dryers are first fastened to a crate base and dust wrapped. A one-piece wrap-around section is nailed to the base. Seconds later the lid is fastened into place, with hardly a pause in production.

**Call in your Man from Wirebound.** He will gladly study your methods... submit package samples. There is no obligation or cost.

Send for Free informative booklet, "What to Expect from Wirebounds"



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## editorial voice of the national safe transit program

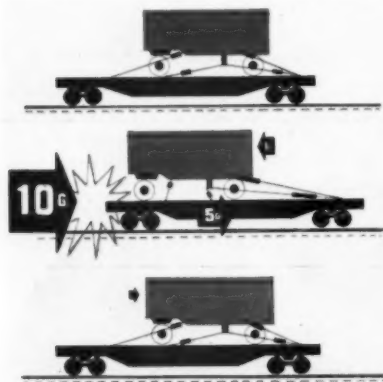
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DANA CHASE PUBLICATIONS, INC.

Devoted to improving packaging shipping, and materials handling methods for the appliance and metal products manufacturing industries. This section contains information on plant experience and industry advances for improving packaging and shipping methods, and prevention of in-transit loss. It also contains information on the National Safe Transit Committee's preshipment testing program and reports on NST activities.

### Elastic Tie-Downs Protect Sensitive Lading

Damage losses on many types of units now being shipped by rail can be reduced, and some products previously restricted to other methods of shipment can now be transported by rail, due to



a new lading tie-down manufactured by Lord Mfg. Co., Erie, Pa. Called the Lord Tylastic Tie-down System, it was developed in cooperation with the military, who are using it with missile ground support equipment.

Lord designed the system to provide gradual shock absorption by permitting the lading to move during impact. Equipment is elastically restrained on a flatcar by a small number of elastomeric spring and cable (or chain) assemblies. During extreme handling operations where cars could be impacted at speeds of eight to ten miles per hour, this system is said to absorb up to 90 percent of the longitudinal shock force on the flatcar floor and prevent it from reaching the lading.

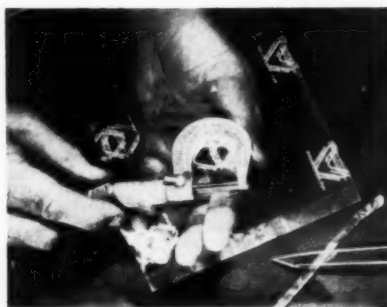
### Corrosion-Preventing Packaging Announced

A new heat-sealable Mylar packaging material treated with a volatile corrosion inhibitor is being produced by Nox-Rust

Div., Daubert Chemical Co., Chicago, Ill.

The packaging combines good looks with the demanding requirements for military and industrial packaging, according to the manufacturer.

Marketed as Nox-Rust Clear-Pak, the treated material protects packaged ferrous metal parts and components from rust and corrosion by releasing an invisible vapor into the atmosphere within the package, and provides additional protection against metal damage by being a natural barrier to corrosive hydrogen sulfide vapors.



### Narrow Aisle Walkie Truck Bulletin

Bulletin 913 issued by The Raymond Corp., 260-183 Madison Ave., Greene, N. Y. describes the company's line of electric walkie trucks designed for narrow aisle operations.

The newly designed Model C tractor can be powered either by four 6-volt "golf cart" batteries or two 12-volt industrial batteries. A dual voltage electrical system allows the speed and power to be regulated by using either a 12 or 24-volt circuit. For slow starting speeds and light loads, the batteries are connected in parallel to provide a 12-volt circuit. For fast speeds, heavy loads and ramp operations, a fingertip control button changes it into a series circuit to provide 24-volt power.

### Bag Dumper for Industrial Plants

The dumping of bagged material is now simplified with the Cesco Bag Dumper. Bags of all types may be emptied — burlap, multiwall, open-mesh, cotton, polyethylene, as well as other textiles and plastics.

Detailed information on all models is contained in Bulletin No. 100, available from Conveyors and Dumpers, Inc., Div. of Mercury Industries, Hillsdale, N. J.

### Uses Chemically Treated Containers for Protection

All 1960 Hotpoint refrigerators are protected for shipment with special corner pads made of a chemically-treated corrugated board developed by Stone Container Corp., Chicago, Ill. Master corrugated sleeves are slipped over the product to protect it from dust and

PHOTO COURTESY STONE CONTAINER CORP.



moisture. The corrugations provide protection against scuffing, scratching or abrasion for painted or plated metal surfaces. Hotpoint's experience with the product, known as Stone-Kote, began in 1959 with experimental packaging of thousands of refrigerators. "No cases of abrasion or scratching were reported in tests which included vibrations equal to 10,000 miles of travel in a freight car, temperatures from 0 degrees to 300 degrees, and humidities of 95 RH at 900 degrees temperature."

# Shipping safe transit — a progress report

**a look at NSTC's  
13-year history  
reveals growth in  
size and influence**

**M**ORE THAN 200 INDUSTRIAL FIRMS are fully certified participants in the National Safe Transit Committee program and are conducting pre-shipment tests of their packaged products on a regular basis. As shipper interest in performance-type testing continues to grow, manufacturers on a national scale are turning to NSTC pre-shipment tests, which are widely recognized as standard minimum tests.

While a significant increase in the number of companies installing testing equipment is reported, the majority of firms participating in the NSTC program rely chiefly on container and independent commercial testing laboratories for their regular testing. Eighty-six NSTC certified laboratories are now serving industry from coast to coast and from the Mexican border north into Canada.

## **Label promotes interest**

Interest in the Safe Transit label has spread into all industrial areas since the introduction of the new type label which can be imprinted on the container itself. Shipments bearing the widely recognized Safe Transit mark of quality are being transported to distribution points, dealers and final customers at the rate of 12 million annually.

Technical and professional groups from the manufacturing, packaging and transportation fields, as well as from universities and other organizations, are hearing the Safe Transit story through personal presentations by the NSTC staff and associates.

In recent months, meetings at Purdue, Pennsylvania State, Wayne State, and Southern Methodist Universities have featured NSTC discussions. Shipper-carrier groups on both the East and West coasts, as well as the Midwest and South, have heard NSTC's program described and have seen the NSTC films.

NSTC's president, Ralph F. Bisbee, has recently returned from a short trip to the Los Angeles area where he visited



During his recent visit to Southern California, Ralph F. Bisbee (left), president of the National Safe Transit Committee, Inc., Washington, D. C., discussed a national package pre-testing program for shippers with Jack Stout, manager of California Trucking Associations, Inc.'s Freight Loss and Damage Prevention Bureau.

many certified manufacturers and laboratories. During part of his stay in California, Bisbee was accompanied on his calls by Jack Stout, manager, Freight Loss and Damage Prevention Bureau, California Trucking Associations, Inc. Stout and Bisbee visited, among others, Beckman Instruments, Inc., Fullerton, Calif., where they viewed Beckman's new all color-sound film which features the NSTC pre-shipment testing program as applied to Beckman Instruments' packaged products. Bisbee was principal speaker at a regular meeting of the Southern California Chapter of the Society of Packaging and Handling Engineers. Seventy members representing a broad segment of local industry were present.

NSTC's Washington office continues to maintain liaison with government agencies and national associations headquartered there.

## **13 years of progress**

For 13 years the NSTC program has been dedicated to the proposition that "All manufacturing, engineering, and quality efforts are in vain if the product reaches its destination in a damaged condition." Recognizing the fact that

safe transit of goods is no accident, and that whenever a group of people or organization does an outstanding job in packaging, materials handling, or transportation, there is usually a dedicated and resourceful individual responsible, NSTC decided to do something about it. The Safe Transit Award was designed early this year, in order to recognize outstanding individual effort in reducing damage to goods in transit.

While measurable progress has been made toward easing industry's damage cost burden, NSTC continues to explore new ways for improving its services to industry. According to Secretary William M. Wilkinson, several proposals regarding technical reinforcement and additional control factors are being considered, and one or more will be selected to implement the 1961 program.

In the competitive struggle being waged for today's markets, no manufacturer can long afford excessive damage losses. NSTC's statement of policy reads: "If you will test your packaged products using the NSTC Test Procedures and identify them with the Safe Transit label, experience has shown that your damage loss and packaging costs will be acceptable minimums." MPM

## FOR VENDING MACHINE ACCURACY AND FLEXIBILITY...



new, low cost HAGEN cycle timers and count switches



Model 73  
Single or Double Circuit  
Repeat Cycle Timer

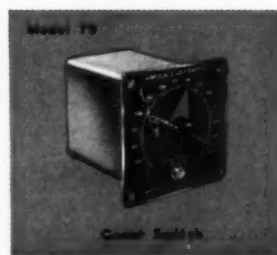


Model 29  
Multiple Circuit  
Repeat Cycle Timer

These new HAGEN time and count devices make possible continuous program control over a wide range of cycles as required in the operation of your vending machines. Powered by "time-tested" HAGEN synchronous motors, these devices can be supplied to operate in hundreds of standard combinations or they can be custom-designed to your specifications.

HAGEN dispensing controls can also help control your production costs. Initial cost is low . . . helping you maintain a competitive price on your equipment. And the superior construction of HAGEN controls means less maintenance, far fewer field returns.

Write for FREE bulletins on HAGEN time and count devices . . . the low cost, high quality controls for vending machines and commercial appliances such as dishwashers, water softeners and dry cleaning equipment. Address Dept. MPM-1260



Model 75  
Count Switch

**BLISS**

**HAGEN**

**MANUFACTURING DIVISION**

*Of The Gamewell Company*

**AN E. W. BLISS COMPANY SUBSIDIARY**

**BARABOO, WISCONSIN**

## Merchandising

→ from Page 26

that by merging you have a chance to grow and that you can put a tangible value on the fruits of your labor.

"However," he cautioned, "remember that in most ways you would no longer be your own independent manager. You may even work harder. By staying single and smaller, you can do business as you like, buy where you wish and pass your business to your children if you wish."

Geiger pointed out another trend in the industry — the consolidations of machine manufacturing companies. Explaining the pros and cons of these consolidations and their effect on operating companies, Geiger predicted that operators will probably be buying equipment from fewer sources and that the choice of equipment might be more limited.

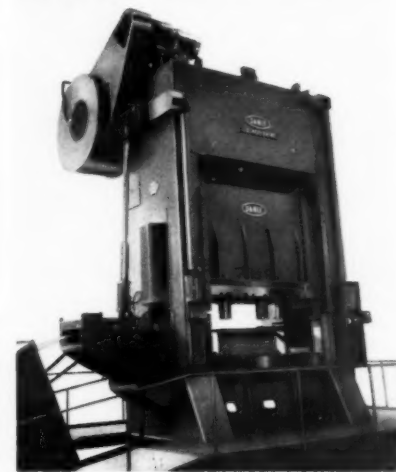
"However," he countered, "such mergers certainly will bring more standardization of equipment, something all of us have long been in favor of."

## Micro Deburring Open House

A four-day open house was the highlight of the recent opening of a \$500,000 plant by Micro Deburring Co. in Centex Industrial Park, Elk Grove Village, Ill. The opening marked the fourth expansion of the firm, which is the Midwest manufacturer for Minnesota Mining & Manufacturing Co., Rampe Mfg. Co., and Stearns Magnetic.

Micro Deburring produces custom barrel finishing equipment. Their new single-story structure occupies 25,000 sq. ft. on a 78,000 sq. ft. tract.

## Danly 400-ton Autofeed Press



Danly 400-ton Autofeed press exhibited at recent Machine Tool Exposition is equipped with a slide cushion, skip-type scrap cutter, grip feed, which is adjustable while in motion, and a coil loading car. Accessories on the press include the Danly slide positioner, Danly load indicator, and the Danly die light.





**A PLUS SERVICE  
FOR MPM READERS**



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*A representative group of  
organizations covered.*

- ★ ★ ★ ★ National meetings in this issue
- ★ Sectional meetings in this issue
- » » » » National meetings in January issue

MPM is the *only* magazine serving the appliance and metal products industry that has consistently covered the industry's important meetings and technical sessions for the benefit of its readers.

MPM does not publish association meeting papers. Instead, the meat of the important business and technical sessions is presented in brief, staff-written, easy-to-read reports.

MPM editors and photographers travel from coast to coast to keep readers posted — *promptly* — with the latest information from top management, product designers, engineers and industry specialists — *a plus service for MPM readers.*

**METAL PRODUCTS MANUFACTURING**



**DANA CHASE PUBLICATIONS INC.**  
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Our client requires Senior Manufacturing Engineer responsible for tooling, assembly and processing. Experience in brazing stainless and aluminum desirable. Excellent salary and benefits. Write in strict confidence. **CHARLES PARTHUM & ASSOCIATES, 2040 W. Wisconsin, Milwaukee 3, Wis.**

### AHLMA conference

→ from Page 19

resulting in easier servicing of the appliance in the field, upgrading of the service function, bringing about profit to the service operation and better training of service personnel as examples.

On the subject of dispensers, Jane Cornish said she feels they are good but cautioned the manufacturer to make sure they don't create extra problems. Hullsiek said that they are designed to make laundering easier for the housewife, but he pointed out that the homemaker must still think and use judgment.

A new addition to this year's program was the Idea Trading Post, the last portion of the conference. Questions, answers and discussion in small conference groups at individual tables enabled those in attendance to secure additional information on subjects of primary importance to them.

As in the past, industry members provided an exhibit of their latest home laundry equipment.

### One coat porcelain

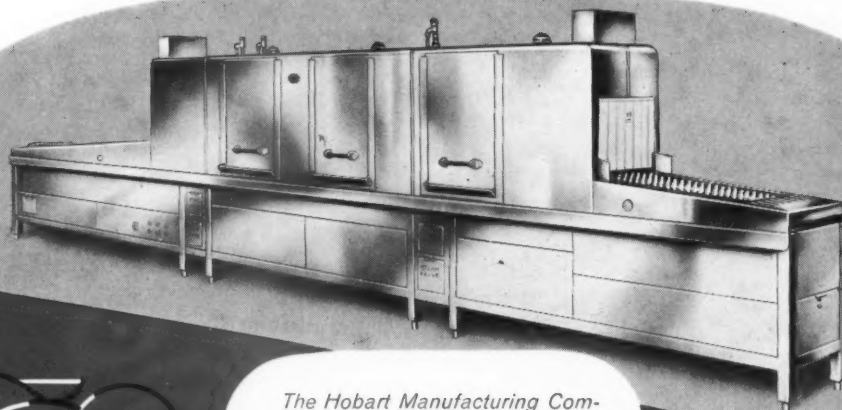
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Results on food liners, for example, show elimination of drain streaks and any reboiling tendency or other sheet steel processing defects. These factors, plus the elimination of corner brushing, result in a better looking finished liner.

It is planned to go to this method of pickling 100 percent after present supplies of steel, other than zero-carbon, are exhausted.

The ferric sulphate-sulphuric acid pickling process was covered in a technical paper presented at the PEI Shop Practice Forum, November 1960. Complete text will appear in the Forum Proceedings.

*NOTE: Editors of MPM desire to thank John C. Swartz, general foreman, Division 4, at Columbus-Westinghouse; Jason M. Zander, chief chemist, and Richard Delott, senior chemist, Chicago Vitreous Corp., for assistance in developing the technical information presented in this article.*



*The Hobart Manufacturing Company is the world's oldest and largest manufacturer of scales and food, bakery, kitchen and dishwashing machines. This fine equipment is famous for speed, efficiency and economical operation in thousands of kitchens serving from two dozen to more than five thousand persons per meal.*

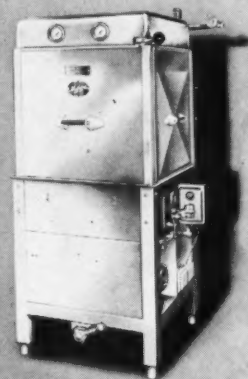
*The performance of Hobart machines is backed up by beautiful design. That's where Cook's Industrial Finishes lend a helping hand. For example, many of the automatic and semi-automatic dishwashers are finished in part with Cook's Epoxy Aluminum, which teams up beautifully with the stainless steel construction of these machines.*

*Cook's supplies top quality industrial finishes to just about every industry you can name, from automobiles to cans for foods and beverages. What about your product? Maybe we have the ideal finish for stepping up its beauty and buy appeal.*



**COOK'S**  
has a part in  
the beautiful  
finish of

**Hobart**  
Kitchen Machines



COOK PAINT & VARNISH COMPANY, Kansas City, Missouri



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Houston



YOU CAN HAVE THE FINEST...

# Specify TEP Products

## 14-Point Assembly Line Inspection Pays Off In Every-Day Performance

Fine quality and long service never just happen. They are the result of good materials, exceptional know-how and an exacting plan of quality control.

TEP Open-Coil Heating Elements get the benefit of 14 progressive inspection operations. Because of this careful quality control procedure, appliance manufacturers are always guaranteed dependable performance with "TEP-built" heating elements. 100% inspection of all units also saves time and trouble in assembly and testing.

*Always specify quality and service . . . specify TEP.*



Inspection of frame slotting operation assures depth control for crossbar "breathing space."

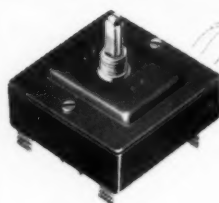


Outer frame gauging and visual cross-bar check insure squareness in accordance with specs.



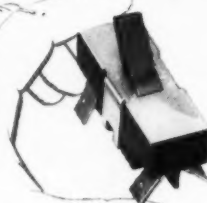
Shape gauging inspection is another control that saves installation time and trouble.

## For Appliance and Related Applications



### 1 HEAT SELECTOR SWITCHES

Series 3000 rotary snap-type switches, also manufactured by TEP for electric ranges, air conditioners, space heaters and related applications, feature positive, trouble-free contact action and 7-heat selection. They are available either with or without a pilot light and with different shafts and handles to suit your needs. Write today for sample and quotation.



### 2 TOGGLE SWITCHES

The unusual simplicity of the new TEP Toggle Switch design achieved by Tuttle Research Engineers, now provides a dependable, top-quality switch at lower cost. Considerably smaller than comparative switches offering the same variety of contacts, it includes provisions for four-way wiring connections. There are only 11 working parts, and the complete switch weighs less than one ounce.



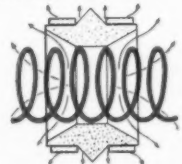
### 3 SINGLE POSITION INFINITE CONTROL

The N-14 Control enables a heating unit to deliver all or any portion of its heating capacity. Proportioning of heating capacity is accomplished by a pre-setting of the control knob, thereby controlling the time of contact dwell. Furnished in various time cycles depending upon your requirements, i.e., from 4 R.P.M. to 1/2 R.P.M. cycle motors.



### 4 TUBULAR HEATING ELEMENT

This element is ideal for a wide range of applications. It's highly efficient in heat guns, hair dryers, space heaters, hot food vendors, photo print dryers, and other products where air is to be heated while flowing through a tube or nozzle. It can be controlled thermostatically and furnished in ratings from 500 to 2000 watts at 115 or 220 volts.



Cross-sectional view of new TEP insulator and cross-bar design. More space for air circulation assures better heat dissipation, longer wire life. Patent No. 2921172

### 5 OPEN COIL HEATING ELEMENTS →

The design and manufacture of "open coil" heating elements has long been a major TEP service to the appliance industry. TEP has designed and developed many new and exclusive features, such as the one illustrated with diamond shaped insulators. Call or write today for TEP design and engineering assistance on any job. There is no obligation.



Wire-threading and inspection are combined in 14-point TEP assembly-line procedure.



Final hi-potential and ohm check before packaging insures correct wattage and wire size.

**TEP** products

WRITE TODAY for complete data and quotations

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MANUFACTURERS OF OPEN COIL HEATING ELEMENTS, SWITCHES, CONTROLS

